

## 2-4 Recommended Test Equipment

Samsung recommends the following equipment when servicing the Laser Printer.

Digital Multimeter	A digital multimeter with attached LED or LCD 4-digit Panel.
Oscilloscope	A digitizing oscilloscope which can measure more than 100MHz
High Voltage probe	A high voltage probe which can measure about less than 10KV
DCU (Diagnostic Control Unit)	DCU can be supplied from Samsung which can easily shows the engine's Error status

Table 2-4-I Equipment List

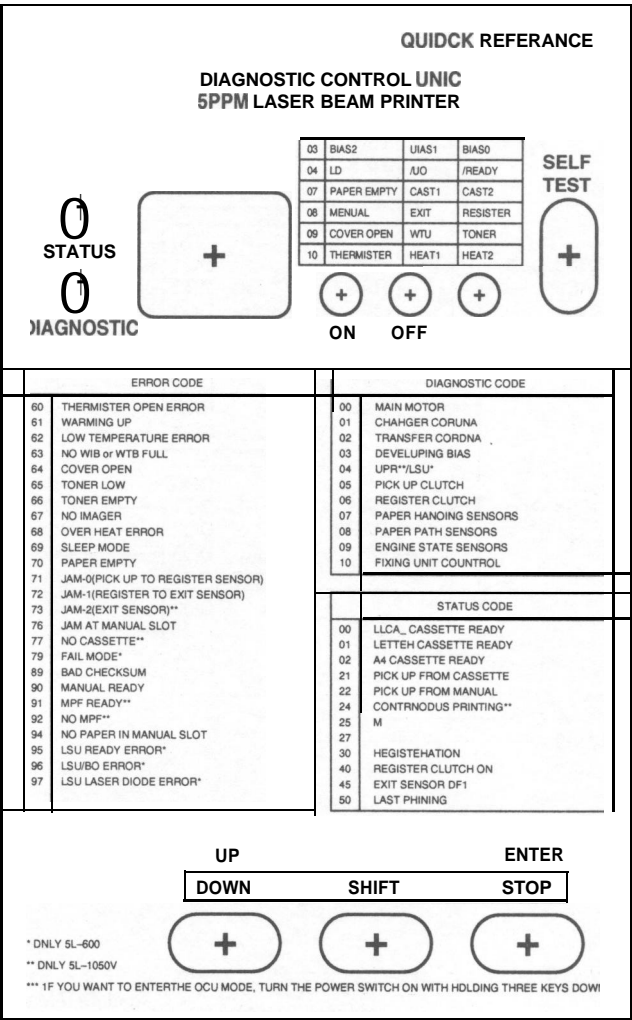


Figure 241 DCU

---

## 2-5 DCU Control

---

### 2-5-1 DCU Setup

The DCU is used to diagnose Printer malfunctions.

The DCU harness wire(10pin-to-4pin) is connected to the Printer engine via:

- 1) Engine Board connector, CN2 (4pins)
- 2) (Video) Controller Board connector, J6 (4pins)

Open the Printer’s side cover(=SIMM Cover) and remove the shield cover and connect the DCU to connector J6 on the Controller Board.

### 2-5-2 DCU Error messages (LED Display)

If an error occurs, connect the DCU to the Printer. DCU messages will indicates malfunctioning areas of the machine.

(Consult Service Manual for detailed troubleshooting information)

Display	Error messages
60	OPEN FUSER ERROR
62	LOW HEAT ERROR
64	COVER OPEN ERROR
68	OVERHEAT ERROR
70	NO PAPER OR CASSETTE
71	PAPER JAM0 (CASSETTE PICK-UP TO REGISTER SENSOR)
72	JAM1 (REGISTER SENSOR TO EXIT SENSOR)
73	JAM2 (EXIT SENSOR TO FUSER)
95	LSU NOT READY

---

### 2-5-3 DCU diagnostic messages (LED display)

After receiving an error message, use the DCU to locate malfunction unit.

<u>Display</u>	<u>Error messaae</u>
0	MAIN MOTOR OPERATING SYSTEM
1	MAIN HIGH VOLTAGE ON (- 14KV)
2	TRANSFER HIGH VOLTAGE (-) ON
3	THV (+) REFERENCE VOLTAGE (+900V)
4	DEV/SUPPLY HIGH VOLTAGE ON
5	LSU OPERATING TEST
6	PICKUP CLUTCH ON
7	PAPER EMPTY SENSOR TEST
8	FEED & EXIT SENSOR TEST
9	COVER OPEN SENSOR TEST
10	FUSER TEST
11	HOT BURN TEST
12	CLEAN (MESSAGE) PRINT
13	THV TRIGGER & THV ON DUTY
14	THV PLUS DUTY

### 2-5-4 DCU Diagnostic Mode

- 1) Connect DCU to Controller or Engine Board
- 2) To apply power, simultaneously press tand hold 'DOWN', 'SHIFT', and 'STOP' keys. 78 will display
- 3) After 2-3 seconds, release the keys. 00 will display
- 4) Press 'UP' or 'SHIFT+DOWN' keys until the desired number is displayed in the DCU display.
- 5) Press 'ENTER' to begin operating.

---

## 6) Example

Select numbers 13 and 14 to adjust the electrophotography trigger voltage.

- 1: Turn power on by simultaneously pressing 'DOWN', 'SHIFT', and 'STOP' for 2-3 seconds.
- 2: Press 'SHIFT+DOWN' until diagnostic code #14 is displayed.
- 4: Press 'SHIFT' and 'STOP' to exit routine.
- 5: Press 'SHIFT' and 'DOWN' to display diagnostic code #13.
- 6: Display will alternate between electronic photography trigger voltage and On duty voltage.
- 7: To end operation, press 'SHIFT' and 'STOP' keys.

## 7) DCU Error Message

- a) Error message '60', 'THERMISTOR OPEN ERROR'  
Error message '62', 'LOW TEMPERATURE ERROR'  
Error message '68', 'OVERHEAT ERROR'

Action:

- 1) Measure Fuser's Thermistor resistance  
Normal Thermistor resistance is 2-3 ohms (110V), 6-10 ohms (220V)
- 2) Confirm Fuser Lamp operation
- 3) Measure Engine Board resistances at Q101 (Triac Thyristor)
- 4) Replace Engine Board Q 10 1
- 5) Replace Engine Board Q3 (KSC 1008-Y)
- 6) Replace Engine Board PC 15 1 (Triac Photo Coupler)

- b) Error message '70', 'PAPER EMPTY'

Action:

- 1) Check for paper in cassette tray
- 2) Replace OP2 Sensor (Photo Interrupter)
- 3) Confirm Feed Clutch operation (mode '06')
- 4) Replace Feed Clutch or Engine Board's Q4 (KSC 1008-Y)

- c) Error message '71', 'PAPER JAM- 1'

Action:

- 1) Check for paper in cassette tray
- 2) Check for Pick-up unit wear
- 3) Replace OP 1 sensor (Photo Interrupter)



- 
- d) Error message '72', 'PAPER JAM-2'  
Error message '73', 'PAPER JAM-3'

Action:

- 1) Confirm that normal paper is being used
- 2) Check for Paper Jam in Fuser
- 3) Replace sensor 'SW 1' on Engine Board
- 4) Check for Fuser Roller contamination

- 8) Error message '95', 'LSU READY ERROR'

- a) Confirm normal readings at Engine Boards, Q5 (KSC1008-Y)
- b) Replace LSU

# 3. Product Information

## 3-1 Specifications

### 3-1 -1 Engine(ML-80)

Specifications are correct at the time of printing. Product specifications are subject to change without notice.

Item		Specification & Description	Remarks										
1. Engine		ML-80	Small Footprint										
2. Type		Desktop Page Printer											
3. Print Speed		3 ppm(page per minute) A4 Size, 5% Character Pattern)	At Copy Mode										
4. Resolution		True 600 X 600 dpi(dot per inch)											
5. Source Of Light		Laser Diode (LSU: Laser Scanner Unit)											
6. Print Method		Non-impact Electrophotography											
7. Feed Method		Cassette & Manual											
8. Feed Side		Side Loading	Left Adjust										
9. Paper Handling (input)		* Size ① Standard : A4, Letter, Legal, B5, Executive ② Envelope : manual feed only <table border="1"><tr><td>Paper type</td><td>Paper size (mm<sup>2</sup>)</td></tr><tr><td>Monarch</td><td>98.5 X 190.5</td></tr><tr><td>Com-10</td><td>104.9 X 241.3</td></tr><tr><td>Intl DL</td><td>110 X 220</td></tr><tr><td>Intl C5</td><td>162 X 229</td></tr></table> ③ Universal type Length : 150 ~ 356 mm Width: 90 ~ 216 mm * Weight : For Cassette, 60 ~ 90 g/m <sup>2</sup> For Manual, 60 ~120 g/m <sup>2</sup> * Recommended Paper USA: X420, X4024, NEKOSA, BOISE CASCADE EC: REFLEX, ADAGIO Transparencies: 3M (CG3300 or 3360) Label: AVERY 53XX series	Paper type	Paper size (mm <sup>2</sup> )	Monarch	98.5 X 190.5	Com-10	104.9 X 241.3	Intl DL	110 X 220	Intl C5	162 X 229	
Paper type	Paper size (mm <sup>2</sup> )												
Monarch	98.5 X 190.5												
Com-10	104.9 X 241.3												
Intl DL	110 X 220												
Intl C5	162 X 229												
10. Paper Handling (output)		Face Down :150sheets Face Up : 1sheet											
11 Feed Capacity		50-sheet Tray  150-sheet Tray and one optional 250-sheet Drawer	ML-84/85G ML-84/85G plus ML-85, ML-85 plus										
12. Warm-up Time		Between 25seconds											
13.First Print Time		Between 25seconds											
14. Power Rating		AC 100-120V/220~240V (± 15%) 50Hz/60Hz (± 3%)											
15. Power Consumption		Peak: 720W During Printing :150WH (Average)											
16. Power Saving Consumption		During Sleeping : Max 1 SW Less than 28W during 1 hour at first	For EPA										
17 Power Switch		None											
18. Certification & Compliance		CE, TUV, SEMKO, NEMKO, DEMKO, C-tick, CCIB FCC,UL, CSA, CDRH, CB, MEEI	Class B for EMC										
19. Acoustic Noise	Standby	Less than 29dB											
	Operating	Less than 47dB											

item		Specification & Description	Remarks
3. Reliability	MPBJ	2,500 pages/75g Paper	Jam Rate
	MPBF	30,000 pages	
	MTBF	2,250 hours	
		(MTBF = 7.5hours X 20days X MPBF /Monthly Use)	
1. Toner Supply		Print Cartridge	
2. Expected Life Span		100,000sheets	For machine
3. Operating Environment		Temperature : 10 ~ 30 ℃ Humidity : 30 ~ 80 %RH	Normal:22 ℃ 65%
4. Storage Environment		Temperature : 0 ~ 35 ℃ Humidity : 10~ 90 %RH	
5. Weight		Net : Max 9.3kg Gross : Max 10.5Kg	
5. External Dimension		ML-84/85G, QwikLaser 84/85G ML-85, QwikLaser 85 MI-84 plus/85G plus ML-85 plus	360(W) X 367(D) X 176(H) mm 360(W) X 367(D) X 188(H) mm 360(W) X 375(D) X 176(H) mm 360(W) X 367(D) X 188(H) mm
7. Print Cartridge		Life Span : 5,000 pages, 5% Pattern and 50% Duty Developing : Non-magnetic Contact Developing Charging : Conductive Roller Charging Density Adjustment : 3steps (Light, Medium, Dark) Toner Supply Method Exchanging The Developer Toner Checking Sensor : None Transfer System: Conductive Roller Transfer Fusing System : Temperature & Pressure Erasing Method: Light Using LED Ozone Emission : Less than 0.1PPM	Negative(-) PWM Control  Quenching Lamp
8. Packing	Main Kit	Printer 1 Set Cassette 1 Piece Developer Cartridge 1 Piece Guide Manual and Diskettes Power Cord 1 Piece	

3-I-2 ML-84, ML-84 plus or QwikLaser 84

Specifications are correct at the time of printing. Product specifications are subject to change without notice,  
And ML-84 plus has the new front cover.

Item	Specification & Description	Remarks
Interface Engine	SAMSUNG ML-SO	
Resolution	WPS : 600 X 600 dpi PCL4.5 : 300 X 300 dpi	
Emulation Including the driver	PCL4.5 (Compatible with HP LaserJet IIP) Microsoft WPS(W indows Printing System)	
Font	7 bitmaps	
CPU	Motorola MC68322-20MHz	
RAM MEMORY	Standard :1M or 1.5M bytes Optional SIMM Module : For 1M Standard : 4, 16 Mbytes For 1.5M Standard : 4, 16 Mbytes * These SIMMs are compatible with the Computer's,	
R O M	1 Mbyte (Font + Program)	
EEPROM	512bytes	NVRAM
Front Control Panel	4LEDs & 1 key	
0. Interface	Bidirectional Parallel Standard - IEEE1284 COMPATIBLE MODE - IEEE1284 NIBBLE MODE - IEEE1284 BYTE MODE - IEEE1284 ECP WITHOUT RLE - IEEE1284 ECP WITH RLE  Serial Interface Optional - 300,600, 1200, 2400, 4800, 9600,19200, 38400, 57600, 115200 bps - XON/XOFF,DTR/DSR Protocol - Robust XON for XON/XOFF	Centronics  Use ECP cable  RS232C
1. Copy Capacity	Enable up to 999	
2. Interface Switching	Automatic (Serial & Parallel)	
3. Interface Time Out	1 step is 1 second from 20 seconds to 5 minutes. (Zero is disable)	
4. Jam Recovery	Jam 0, 1, 2 according to the Jam position The recopy of Jam 0, 1 is default. The recopy of Jam2 is optional. (Don't use Jam2 recovery under WPS status.)	
5 AEP	Emulation switching according to Emulation code.	
6. Engine Interface Error	All LEDs blink when communication is error	
7. Status Monitor	Bidirectional Status Feedback Animation for printing	WPS only
8. PRS Buffer	755Kbytes	
9. Top Margin	4.23 ± 2.0 mm	PC L Pattern

3-I-3 ML-85, ML-85 plus or QwikLaser 85

Specifications are correct at the time of printing. Product specifications are subject to change without notice  
And ML-85 plus has the new front cover.

Item	Specification & Description	Remarks
1Interface Engine	SAMSUNG ML-80	
2Resolution	WPS : 600 X 600 dpi	
3Emulation Including the driver	PCL5e (Compatible with HP LaserJet 5P) Microsoft WPS(W indows Printing System)	
4F o n t	1 bitmap 45 scalable (35 intelligent, 10 truetype)	
5C P U	Motorola MC68322-20MHz	
6RAM MEMORY	Standard : 2Mbytes Option SIMM Module : 2, 4, 8, 16 Mbytes * These SIMMs are compatible with the Computer's,	
7R O M	2Mbyte (Font + Program)	
8E E P R O M	5 12bytes	NVRAM
9Front Control Panel	4LEDs & 1key	
10. Interface	Bidirectional Parallel Standard - IEEE1284 COMPATIBLE MODE - IEEE1284 NIBBLE MODE - IEEE1284 BYTE MODE - IEEE1284 ECP WITHOUT RLE - IEEE1284 ECP WITH RLE  Serial Interface Optional - 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps - XON/XOFF, DTR/DSR Protocol - Robust XON for XON/XOFF	Centronics  Use ECP cable  RS-232C
11. Copy Capacity	Enable up to 999	
12. Interface Switching	Automatic (Serial & Parallel)	
13. Interface Time Out	1 step is 1 second from 20 seconds to 5 minutes. (Zero is disable)	
14. Jam Recovery	Jam 0, 1, 2 according to the Jam position The recopy of Jam 0, 1 is default. The recopy of Jam2 is optional. (Don't use Jam2 recovery under W PS status.)	
15. AEP	Emulation switching according to Emulation code.	
16. Engine Interface Error	All LEDs blink when communication is error	
17. Status Monitor	Bidirectional Status Feedback Animation for printing	WPS only
18. PRS Buffer	755Kbytes	
19. Top Margin	4.23 ± 2.0 mm	PCL Pattern

3-I-4 ML-85G, ML-85G plus or QwikLaser 85G

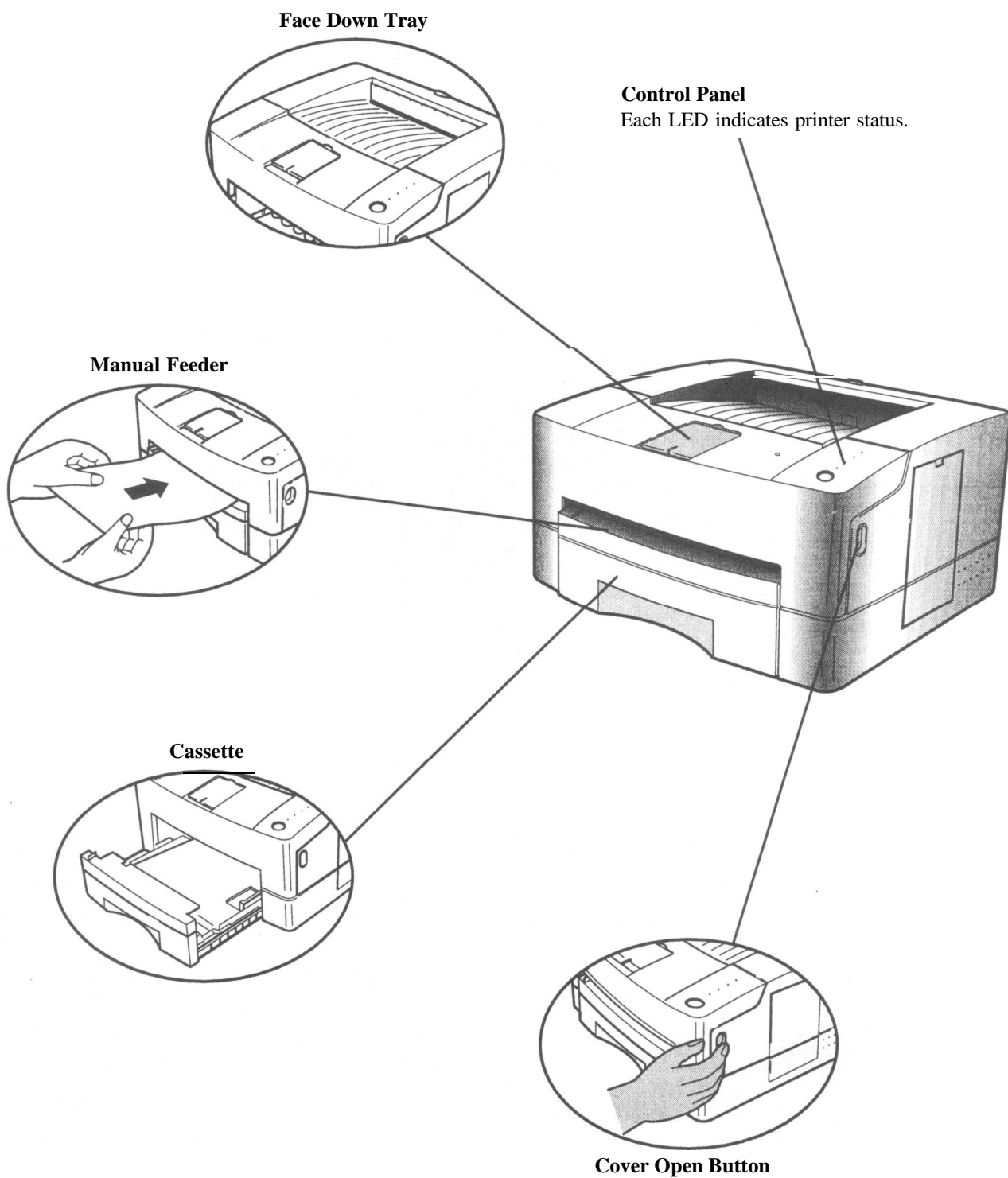
Specifications are correct at the time of printing. Product specifications are subject to change without notice.  
And ML-85G plus has the new front cover.

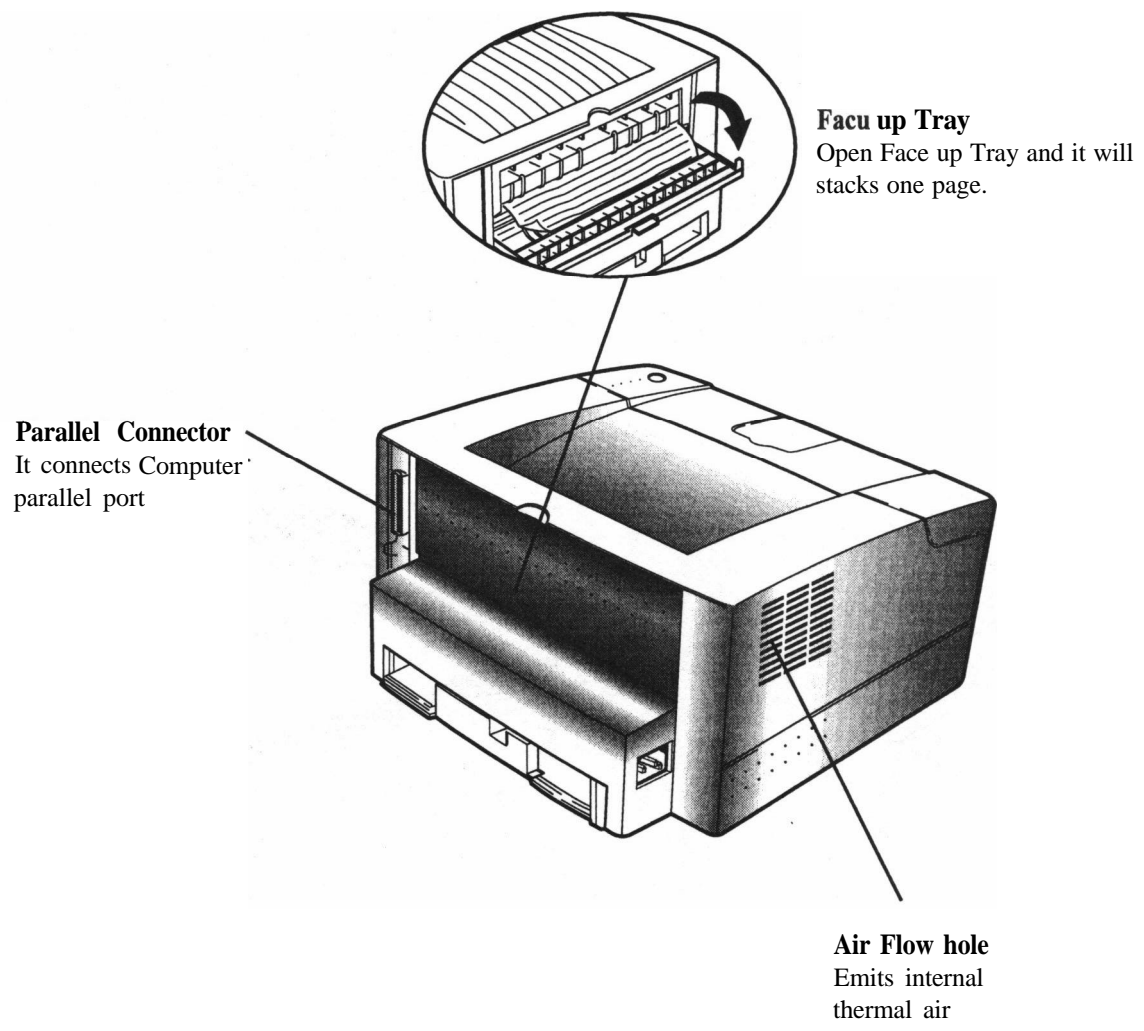
Item	Specification & Description		Remarks
1. Interface Engine	SAMSUNG ML-SO		
2. Resolution	WPS : 600 X 600 dpi Computer 16Mbytes RAM : 300 X 300 dpi		
3 Emulation Including the driver	PCL4 (Compatible with HP LaserJet II) Microsoft WPS(Windows Printing System)		S/W Driver
4. Font	HP LaserJet II Internal fonts		
5. CPU	None (ASIC dependent on host computer)		
6. RAM MEMORY	Standard :0.5Mbytes		No option memory
7 ROM	None		
8 EEPROM(=NVRAM)	ML-85G,ML-85G plus	None	
	QwikLaser 85G	X24C01P	
9 Front Control Panel	ML-85G, QwikLaser 85G	5 LEDs only	POWER LED
	ML-85G plus	4 LEDs only	READY LED ON
IO. Interface	Bidirectional Parallel Standard - IEEE1284 COMPATIBLE MODE - IEEE1284 NIBBLE MODE - IEEE1284 BYTE MODE - IEEE1284 ECP WITHOUT RLE - IEEE1284 ECP WITH RLE Serial Interface : None		Centronics  Use ECP cable
11 Copy Capacity	Enable up to 999		
12. Jam Recovery	Jam 0, I, 2 according to the Jam position The recopy of Jam 0, I is default. The recopy of Jam2 is optional. (Don't use Jam2 recovery under WPS status.)		
13. Engine Interface Error	All LEDs blink when communication is error		
14. Status Monitor	Bidirectional Status Feedback Animation for printing		WPS only
15. PRS Buffer	755Kbvtes		

## 4. Operating Instructions

### 4-1. External Views and Functions

---

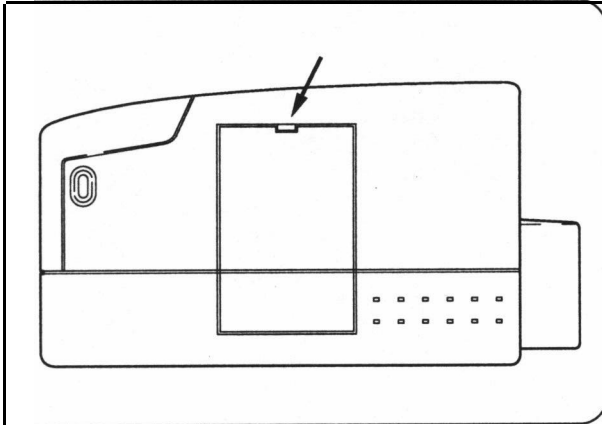




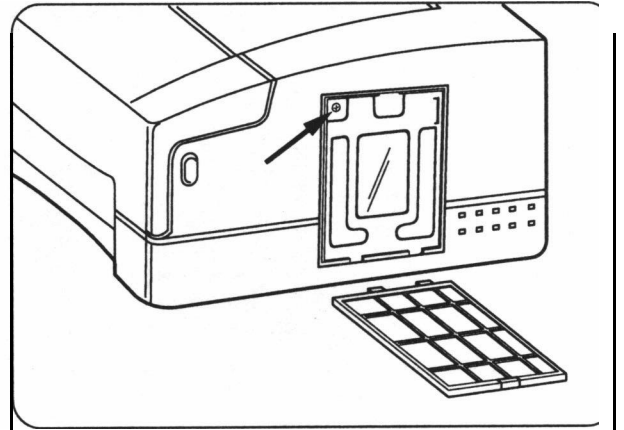


# 5. Disassembly

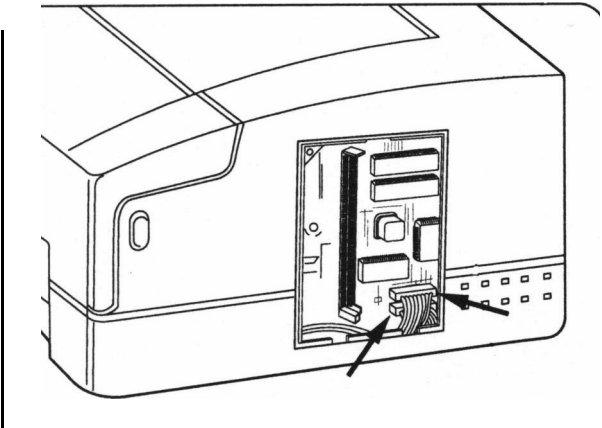
## 5-1. Controller Disassembly



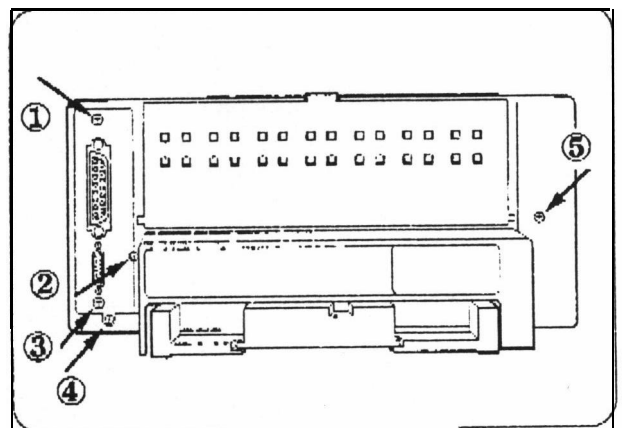
Remove the SIMM cover.  
Push the tab down and pull the SIMM cover away from the printer.



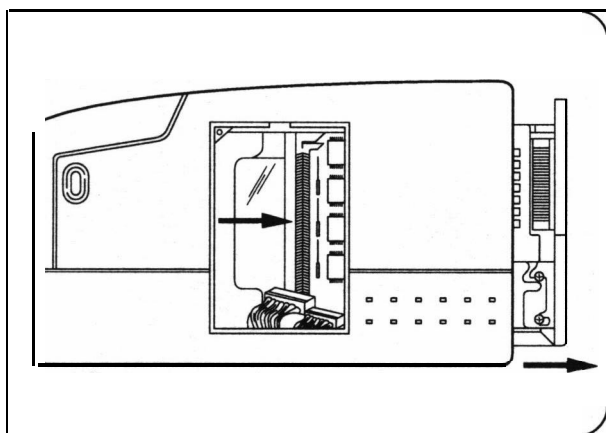
Remove the screw in upper left corner of the metal panel, then remove the panel to expose the video controller board.



Remove the two ribbon connectors on the video controller board.



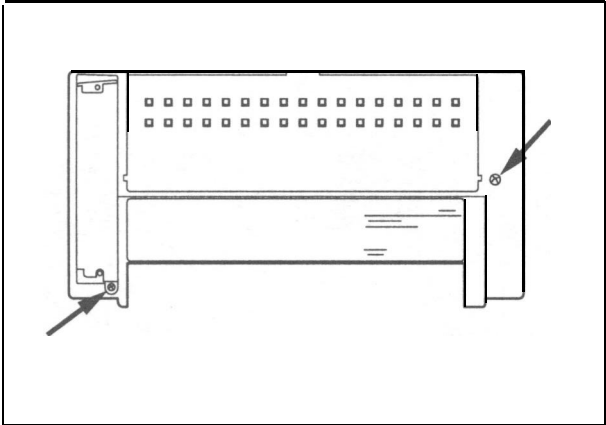
Remove the three screws (①, ②, ③) from the bracket (ICU bracket). If needed, remove two screws (④, ⑤), too.



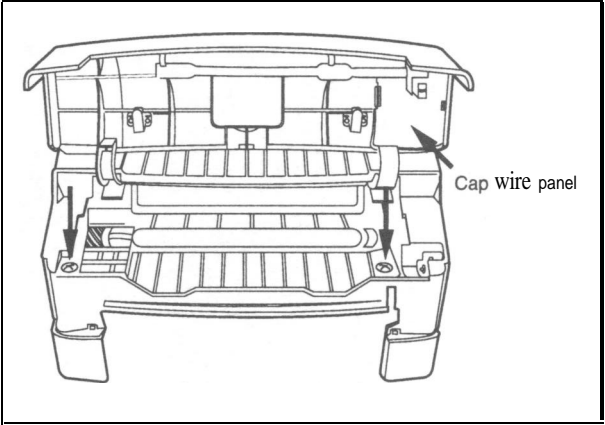
Pull the rear metal panel out and slowly slide the video controller out of the LBP and put it on a flat surface.

## 5-2. Cover Housing Disassembly

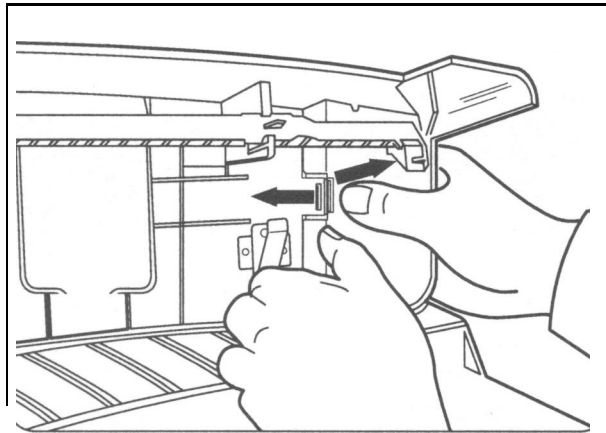
Remove the Drum unit, and place it in a place isolated from direct sunlight.



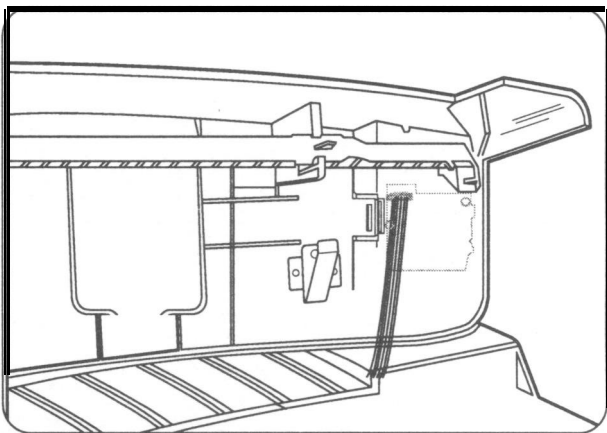
Locate and remove the two screws along the rear side of the printer.



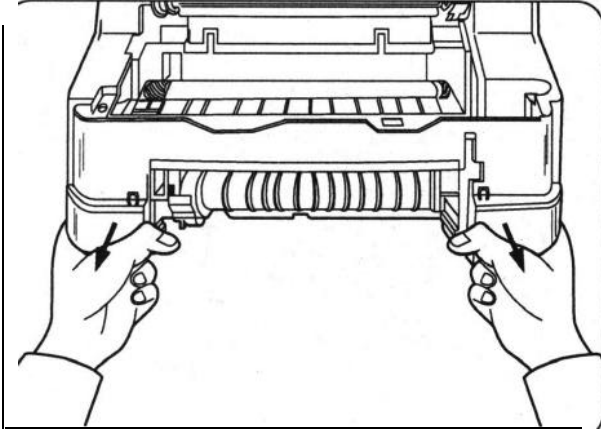
Turn the printer's front to you then lift the door and remove the two screws. If the printer has the Cleaning roller, there should be a connection between OUT of Cleaning board and IN of Cleaning roller.



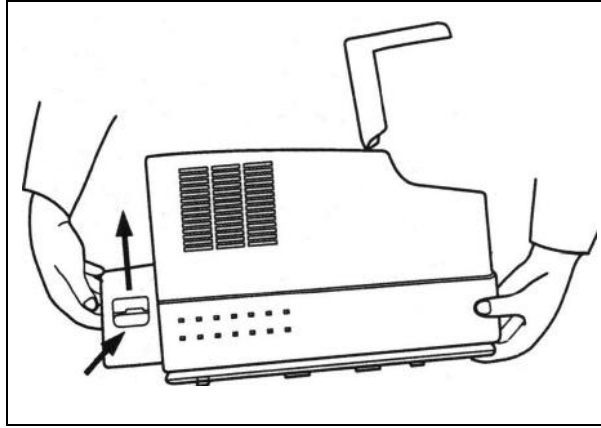
From underneath the door, using your thumb, as shown, pull the hook to the left and then pull out the cap wire panel.



Remove the Panel PBA harness and locate it not to prevent you from working.

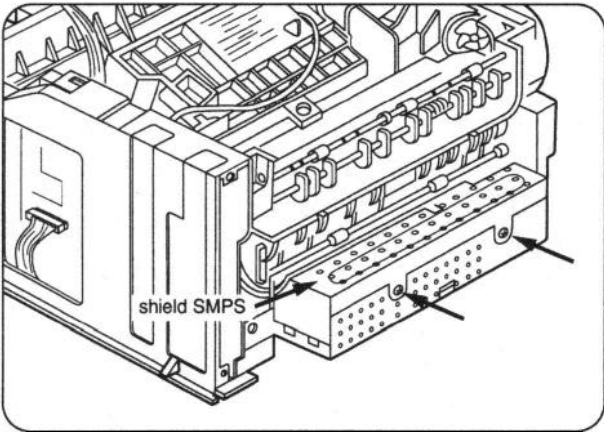


To remove the entire cabinet, release the hook that is near the bottom and towards the right **front** side of the cabinet. To do this, use both hands to elevate the **front** of the printer, push the **frame** lock inward while you pull the cabinet outward.

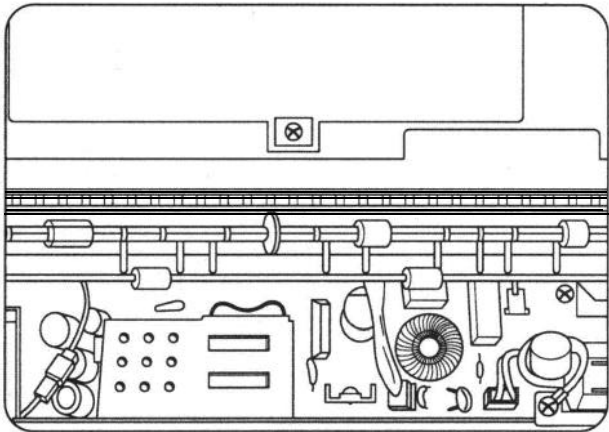


The cabinet also has a lock on the inlet side. Push the inlet inward and pull the cabinet upward. Gently pull the cabinet outward to release the lock as shown in the diagram.

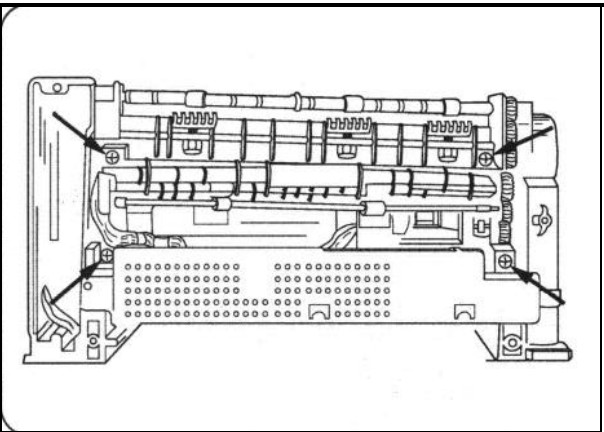
# 53. Fuser Disassembly



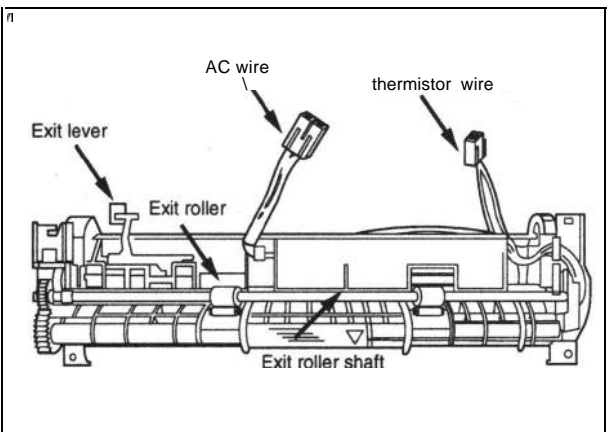
If you have not already done so, remove the printer cabinet.  
Remove the two screws holding the SMPS Shield and lift the shield up and away from the SMPS.



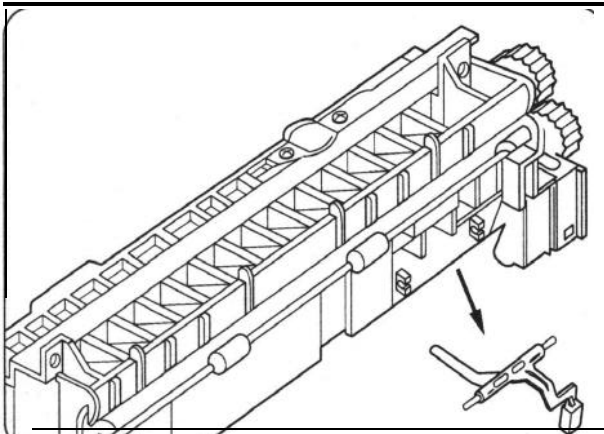
Disconnect the thermistor wire and the heater wire.



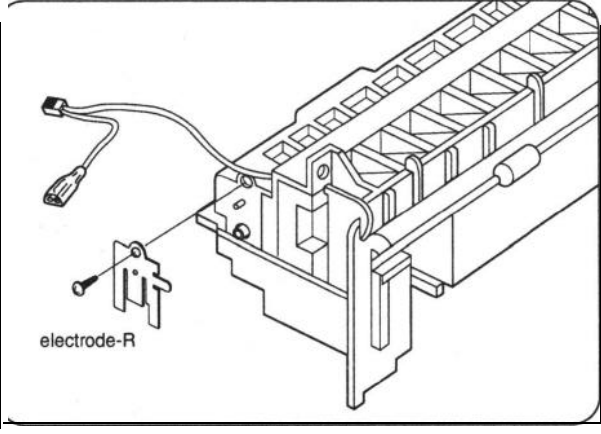
Remove the four screws holding the fuser assembly and pull it away from the printer.



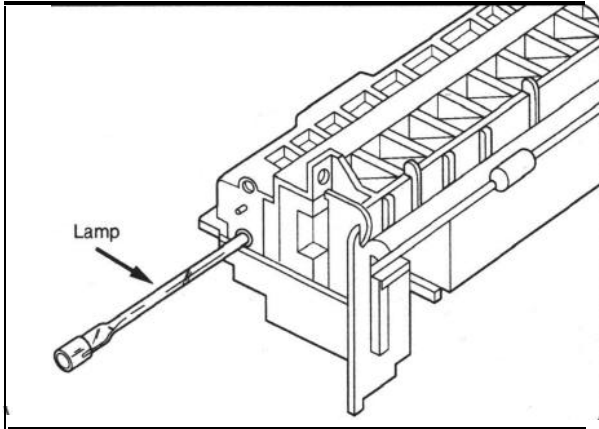
Fuser Assembly.



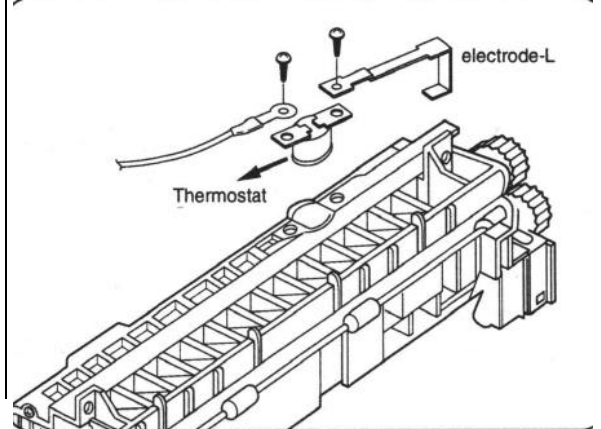
Release the lock holding the actuator and lift one end of the actuator and then the other end up and away from the fuser assembly.



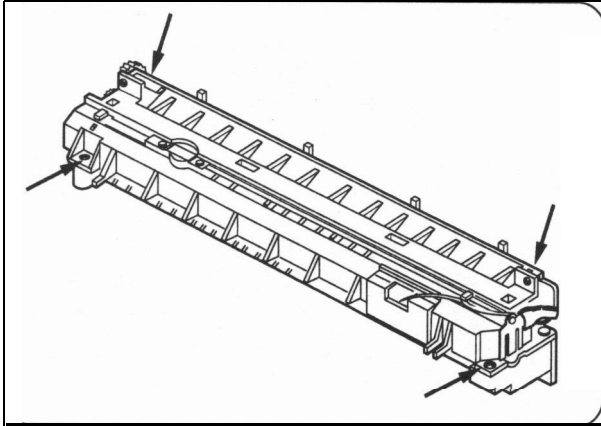
Remove the screw at the end of the **fuser** assembly and pull the right electrode off the **fuser** assembly.



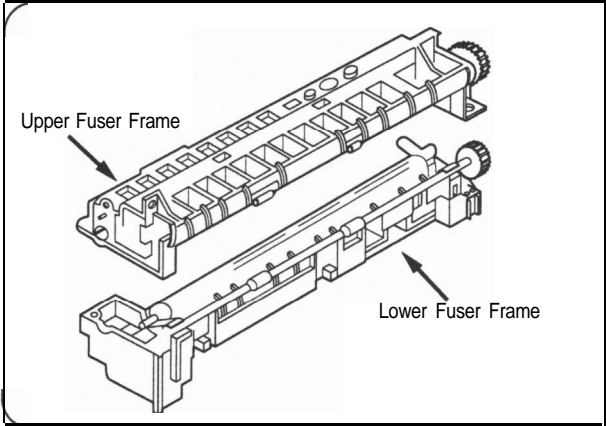
Gently, pull the lamp out of the heat roller.



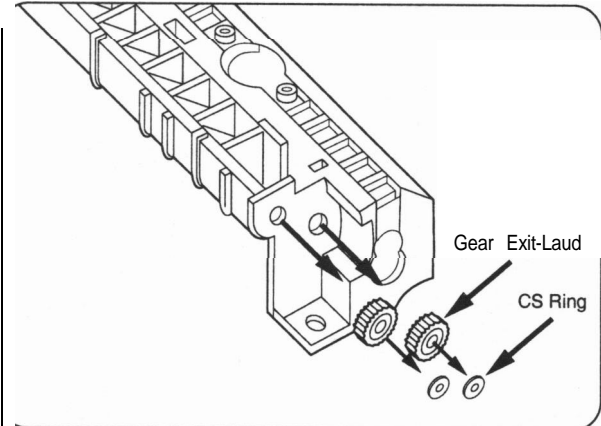
Remove the two screws around the thermostat as shown in the diagram.  
Lift the thermostat out of the **fuser** assembly and **left** electrode.



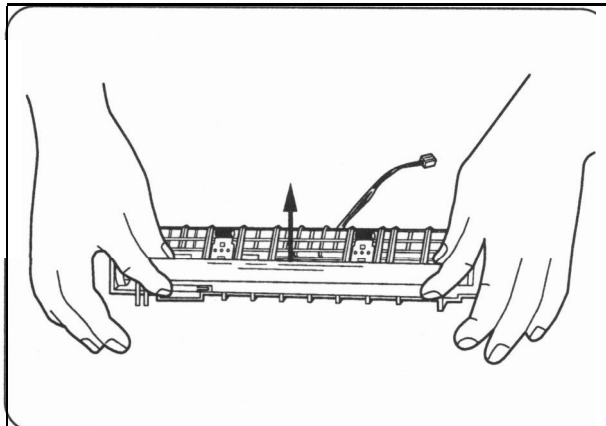
Remove the four screws holding the upper and lower fuser frame together.



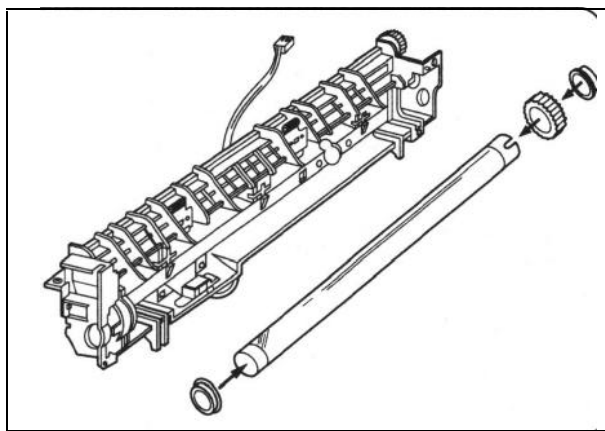
Pull the upper and lower fuser frames apart.



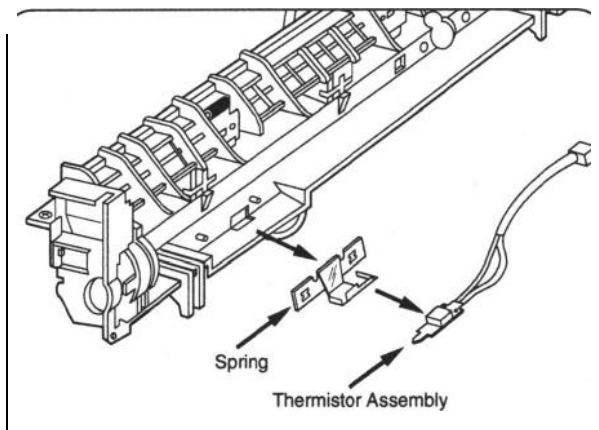
Pull off and reserve the gear exit-land the CS ring.



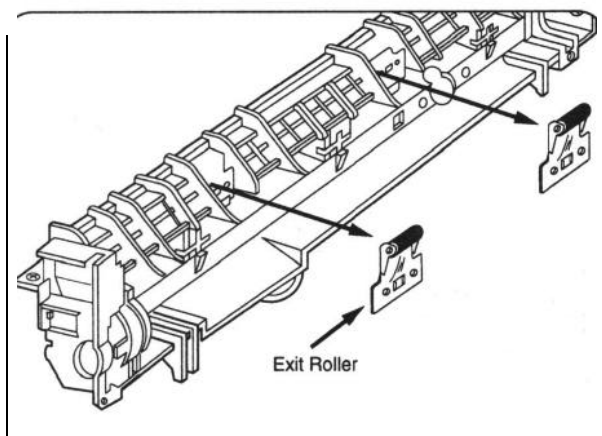
Pull the heat roller up and out of the upper fuser frame.



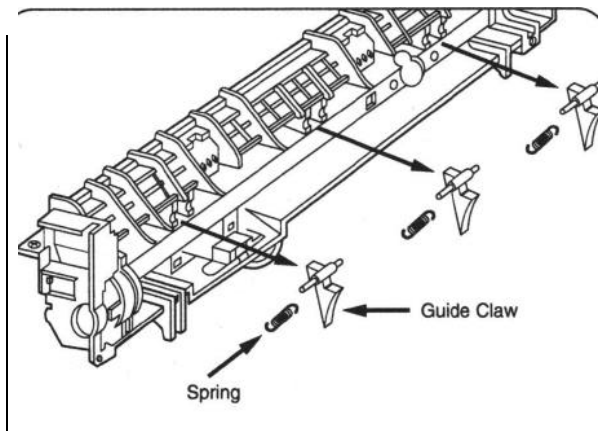
Remove the **fuser** gear from the right end and the bearings from each end of the heat roller.



Gently lift the spring lock point to release the thermistor assembly **from** the underside of the upper **fuser** frame.

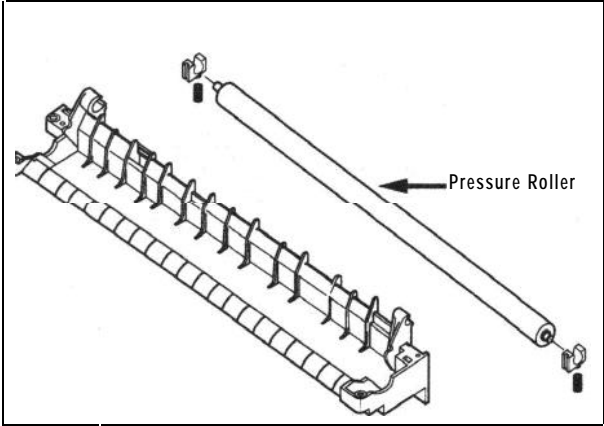


Locate the two exit rollers on the underside of the upper **fuser** frame. Gently lift the spring lock points and remove the exit rollers.

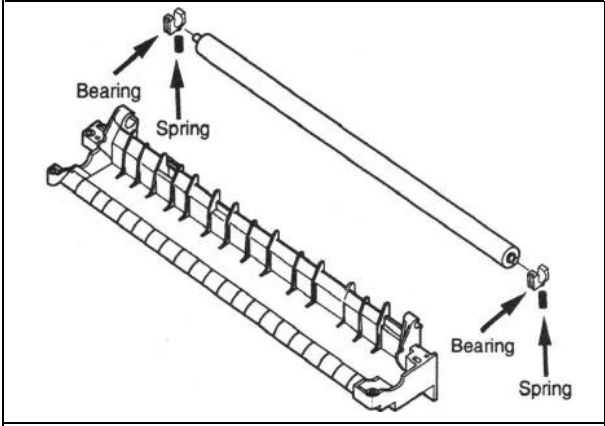


Locate and remove the **three** guide claws and springs.

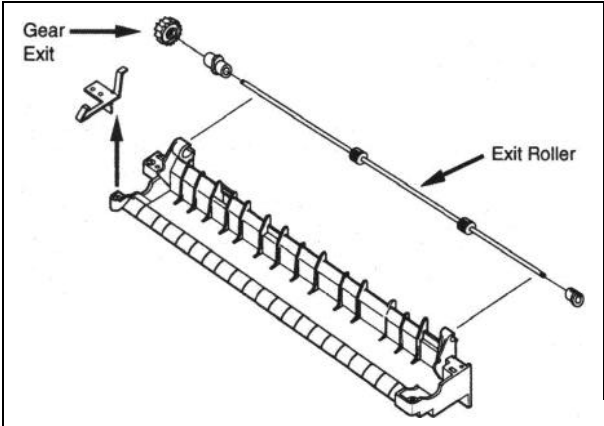




Lift the pressure roller up and out of the lower fuser frame assembly.

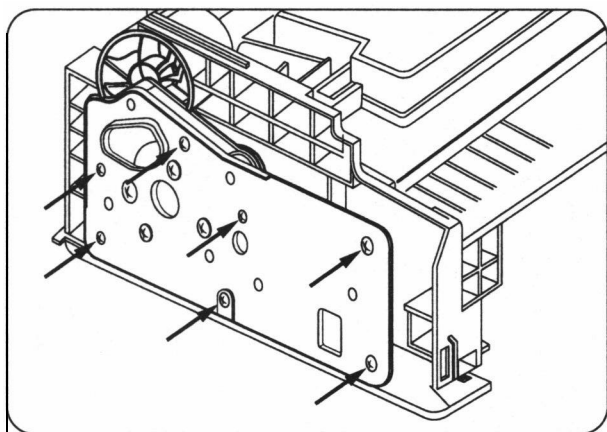


Remove the two pressure roller bearings and their springs.

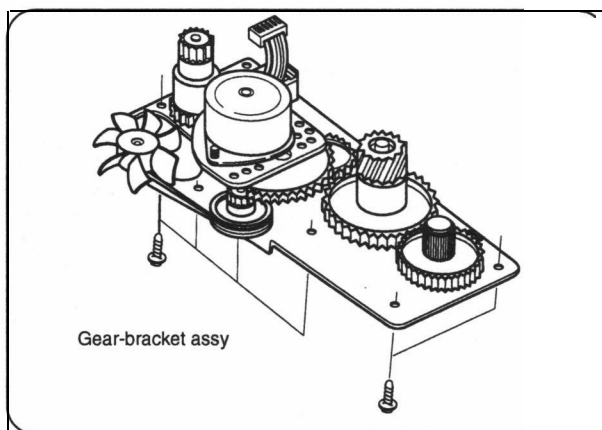


Remove the gear exit from the end of the pressure roller.  
Remove the left bearing exit Roller and right bearing exit roller.

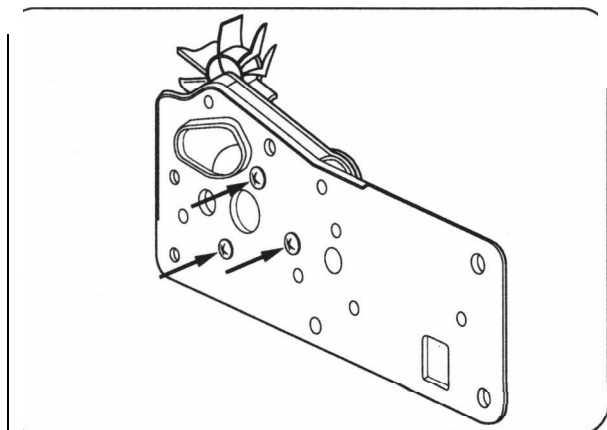
## 5-4. Gear Bracket Disassembly



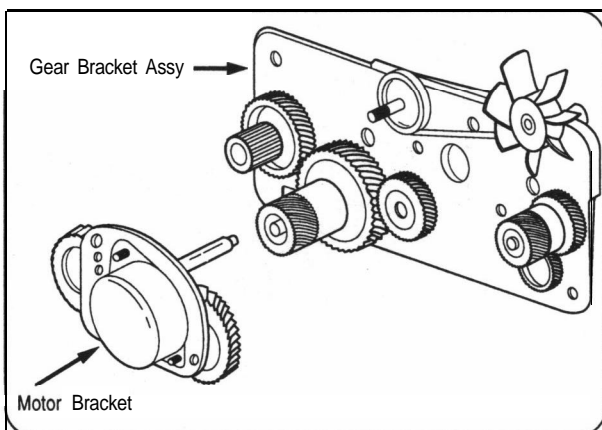
Along the power inlet side of the printer, locate and remove the seven screws which hold the gear bracket assembly on the printer.



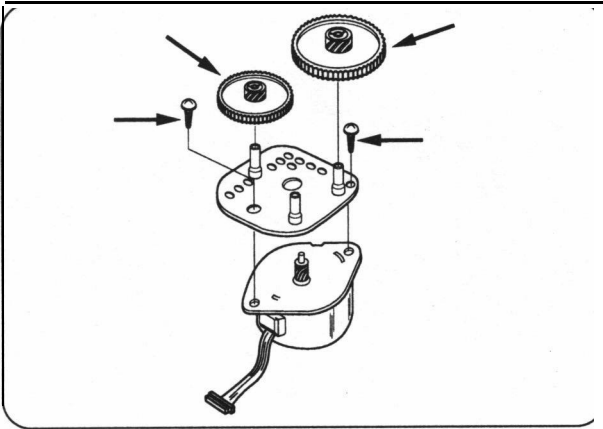
Detach the motor harness from the PWB.



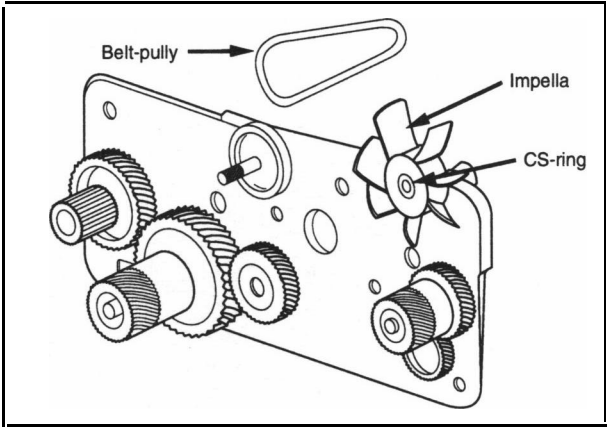
Remove the three screws holding the motor bracket to the gear bracket assembly and pull the motor away.



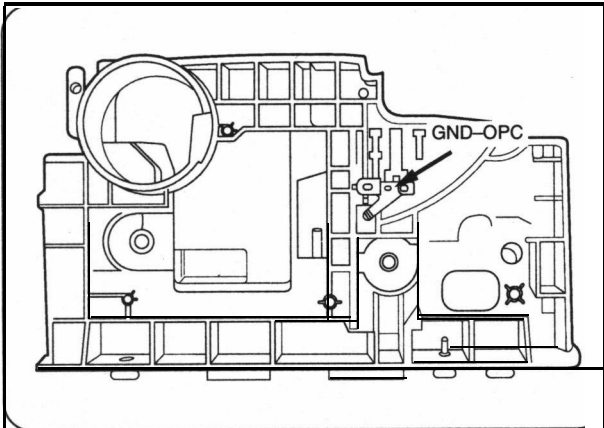
Pull up on the gears individually to remove them.



Remove the two screws on the motor bracket to separate the motor from the motor bracket.



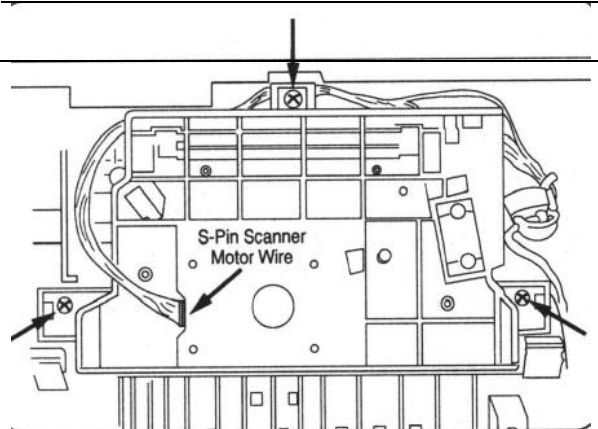
On the gear train, remove the belt pulley and CS ring to remove the impella. Other gears on the gear train have permanently welded gear locks.



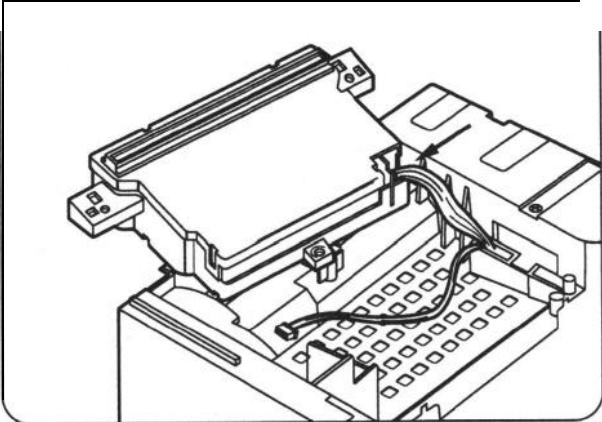
The OPC Ground can be removed after taking off the gear bracket.

# 5-5. LSU Disassembly

---

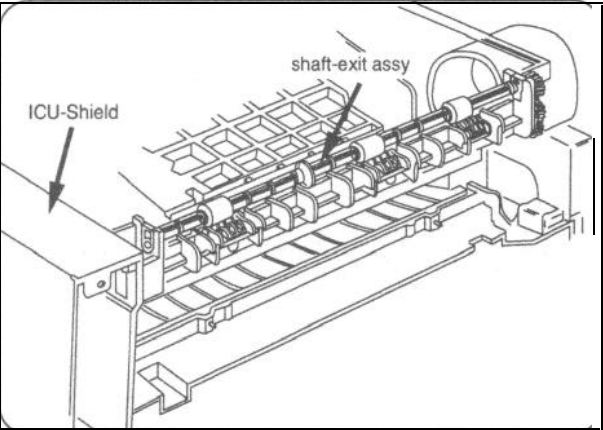


Remove the three screws holding the LSU in the lower part of the printer.

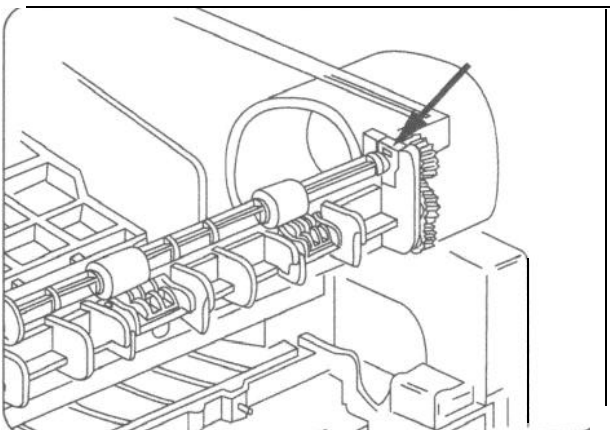


Detach the **5-pin** scanner motor wire then **lift** the LSU while you detach the 6-pin LD wire.

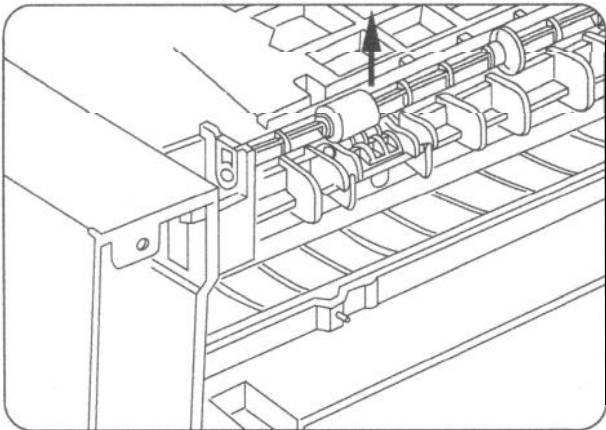
# 5-6| Shaft-Exit Disassembly



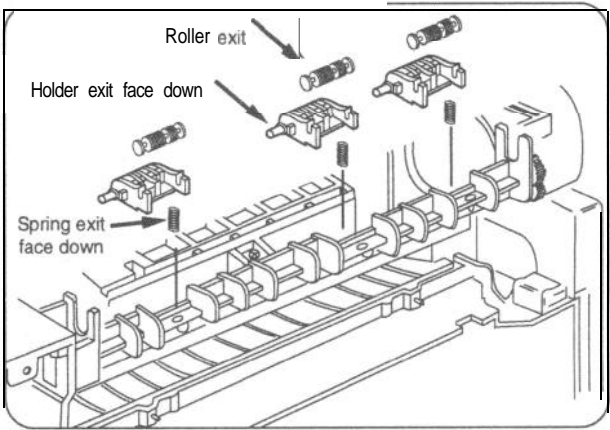
If you have not already done so, remove the ICU Shield.



Release the exit bearing on both sides of the exit shaft.

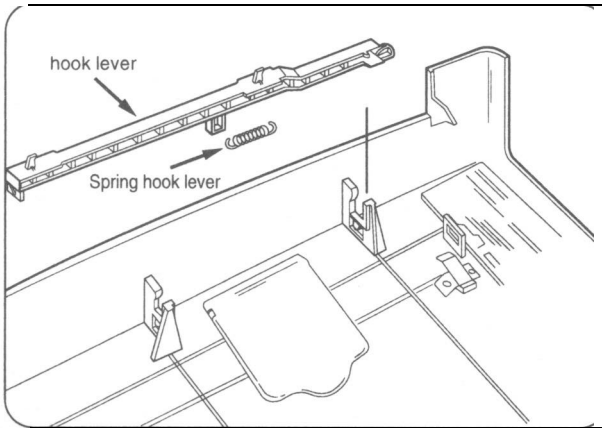


Lift the exit shaft up and away from the printer.

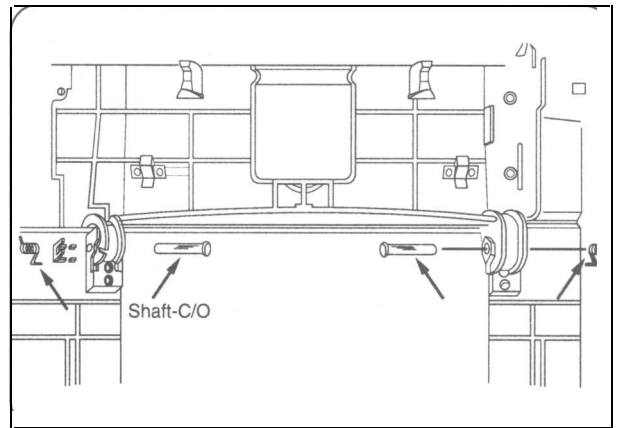


Locate and remove the face down exit spring, face down exit holder and exit roller.

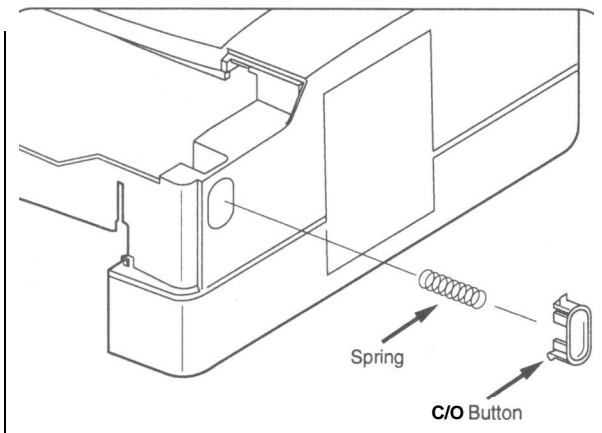
## 5-7. Top Cover Disassembly



If you have not already done so, remove the printer cabinet and cap wire panel.  
Working on the underside of the top cover, release the spring hook lever and remove the hook lever.

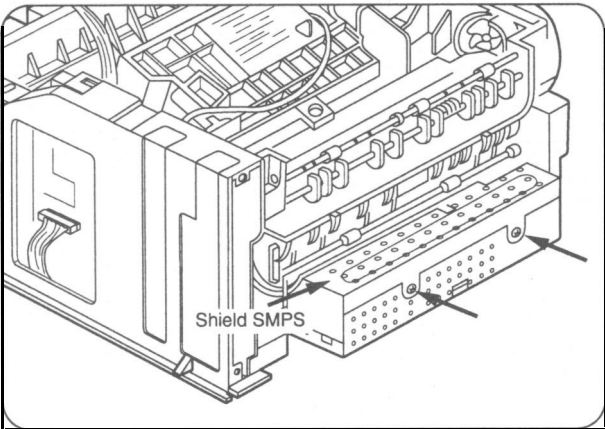


To remove the top cover from the cabinet, remove the four screws holding the two spring-C/OS.  
Pull out the C/O shaft and separate the top cover from the cabinet.

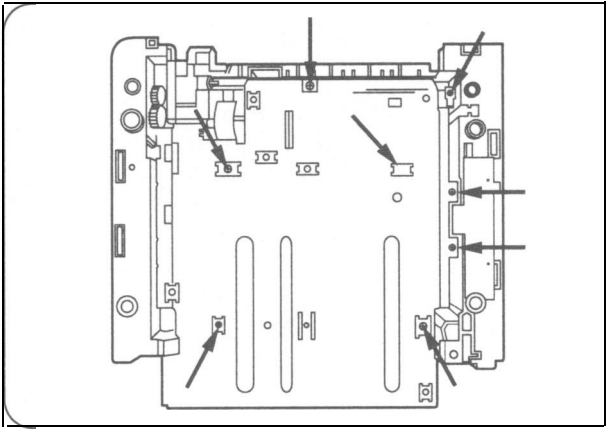


Remove the C/O button by pressing in the hook and pulling the button and its spring out of the cabinet.

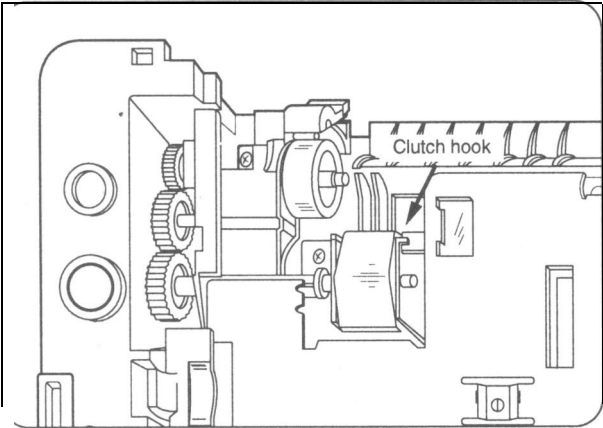
# 5-8. Engine PCB Disassembly



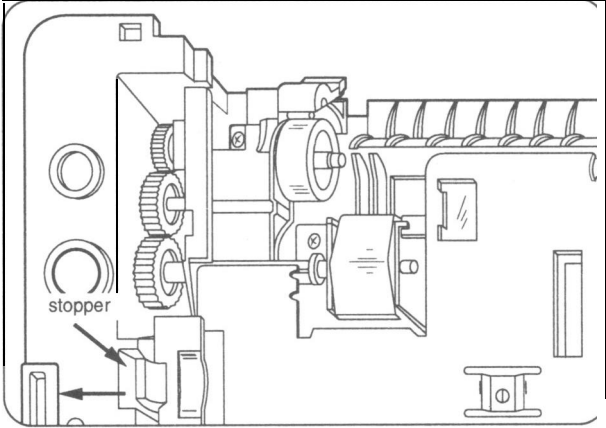
If you have not already done so, remove the printer SMPS shield.



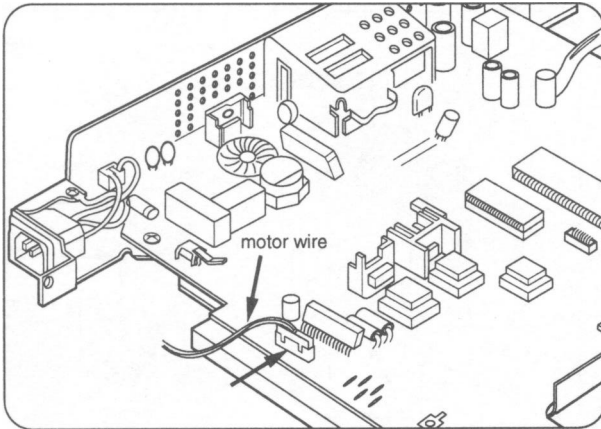
Remove the eight screws which hold the PCU assembly.



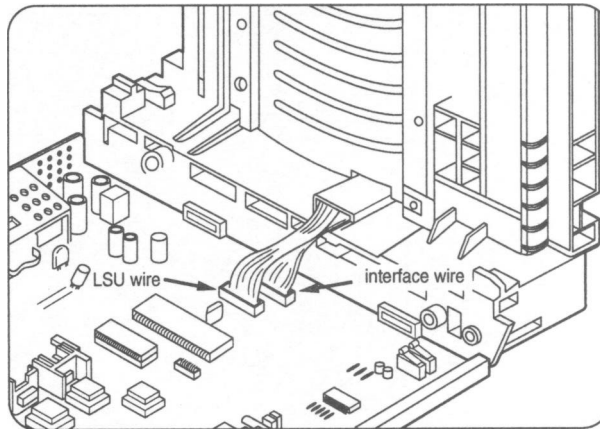
Unlock the pickup roller from the solenoid.



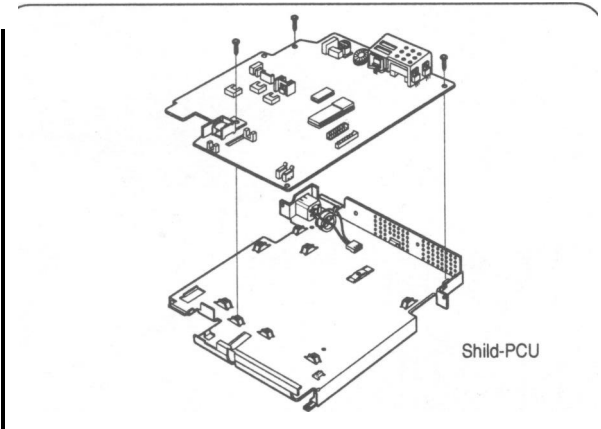
Locate the pickup roller stopper under the solenoid's actuator. Unlock the stopper by pressing it forwards to power inlet. Pull the PCU assembly out of the printer.



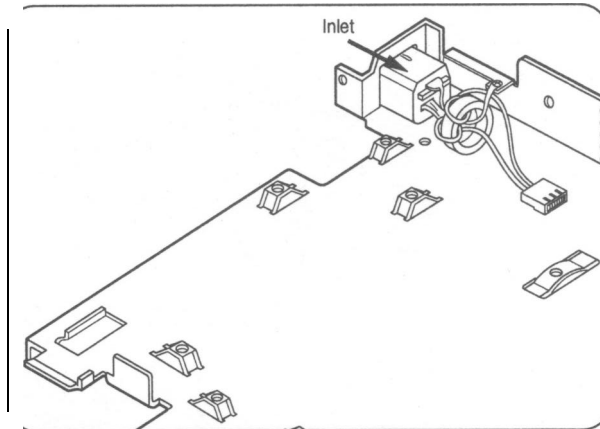
Detach the motor wire from the motor connector.



Unplug the LSU wire and the ICU wire from the PCU assembly.



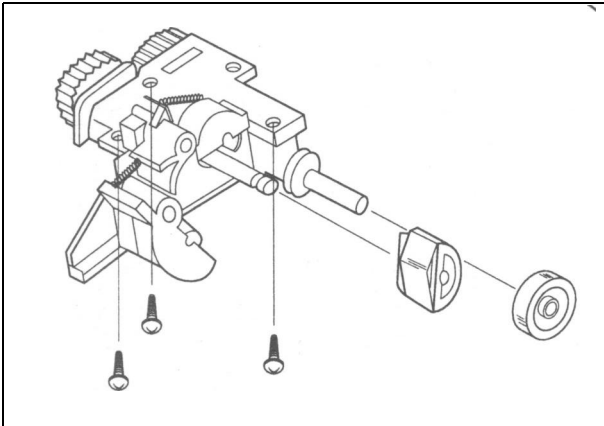
To remove the power inlet assembly, remove the screw. Unlock the inlet by pressing the top and bottom sides of the inlet and pull it out from the PCU shield.



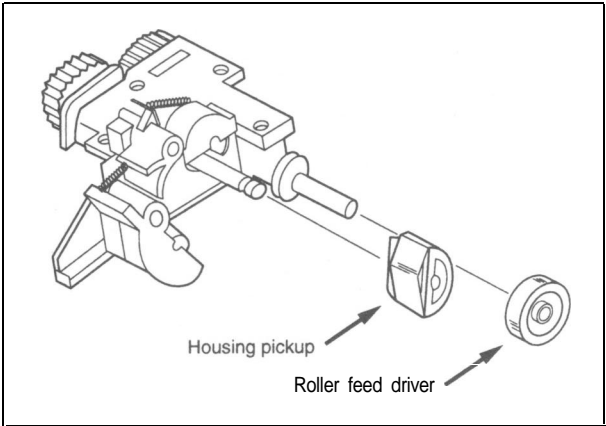
Unplug the AC input connector. Remove three screws from the PCU assembly and separate the PCU from the PCU shield.



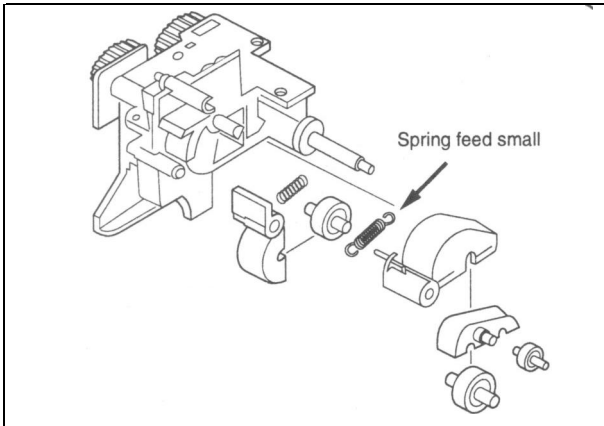
# 5-9. Feed Assy Disassembly



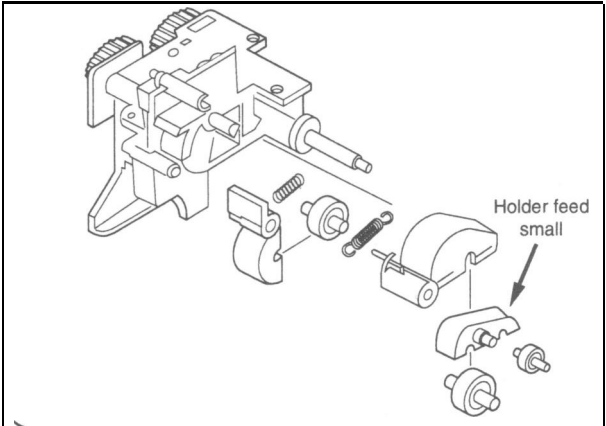
If you have not already done so, remove the PCU assembly.  
Remove the three screws holding the feed assembly in the printer.  
Pull the pickup roller off the feed assembly.



Pull the pickup roller and feed roller off their shafts after spreading the hooks holding the shafts.

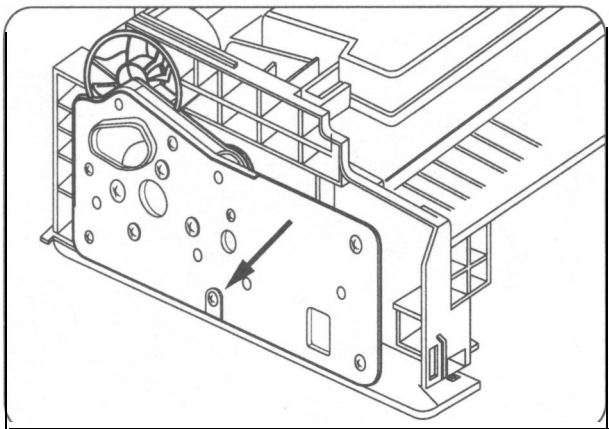


Unhook and remove the small feed spring.  
Detach the small feed holder.  
Pop the small feed subholder out of the small feed holder.  
Remove the small feed roller and the large feed roller and separate them from their idle feeder shafts.  
Detach the large feed spring.  
Detach the large feed holder.

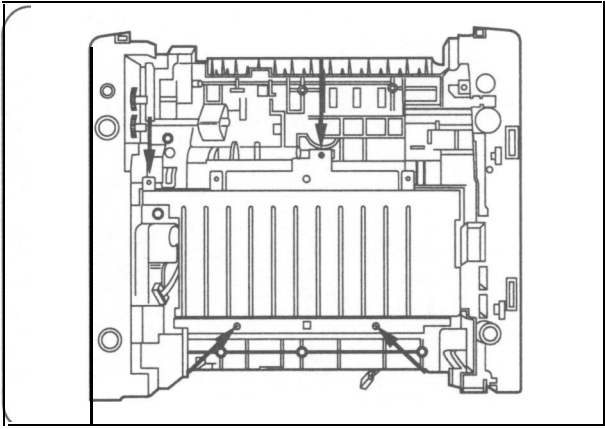


Pop the large feed subholder out of the large feed holder and remove the large feed roller and its idle feeder shaft. Spread the hook of the pickup gear's shaft and pull off the pickup gear drive.  
Remove the pickup gear.  
Pull off the pickup lever and the pickup spring.  
Remove the two pickup bearings and the feeder gear.  
Remove the feeder grounds.

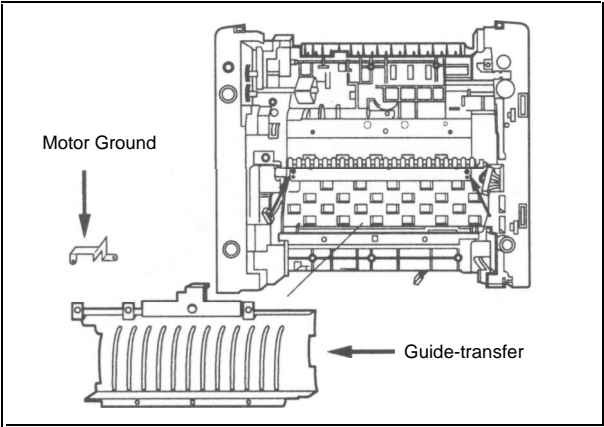
# 5-10. Guide Transfer Disassembly



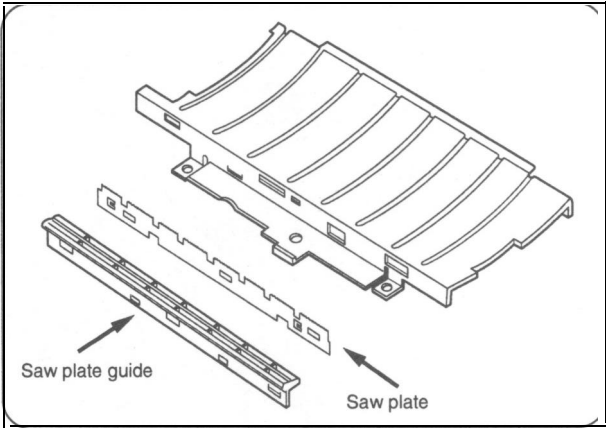
Remove the screw securing the motor ground to the gear bracket.



Remove the four screws securing the transfer guide inside the printer.

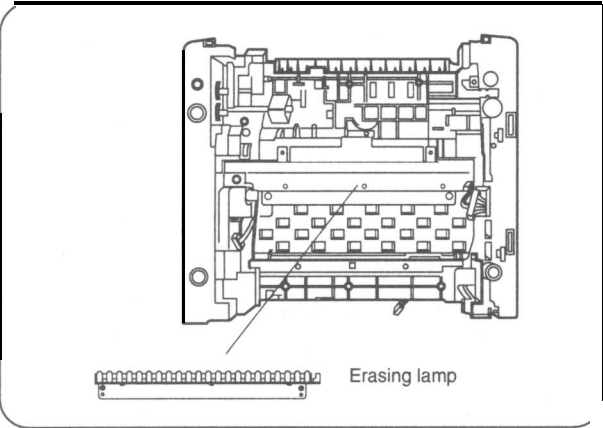


Left the transfer guide up and out of the printer.



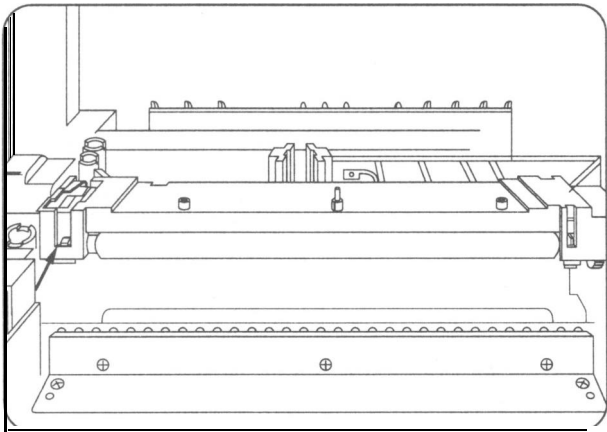
Slide the saw plate assembly stopper to the left. Separate the saw plate assembly and the stopper. Press the three locks on the saw plate assembly and release the saw plate.

# 5-I 1. Erasing Lamp Disassembly

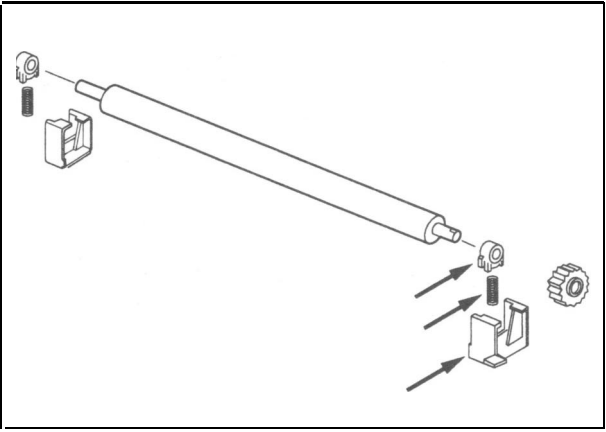


Remove the two screws holding the quenching lamp assembly in the printer.

# 5-I 2. Transfer Roller Disassembly

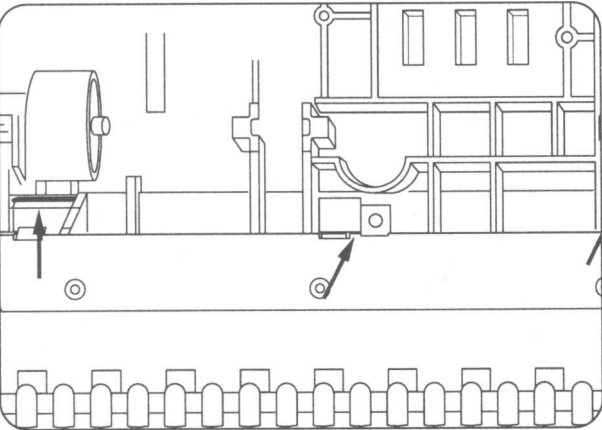


Press the locking tabs at both the left and right sides to release the transfer roller.

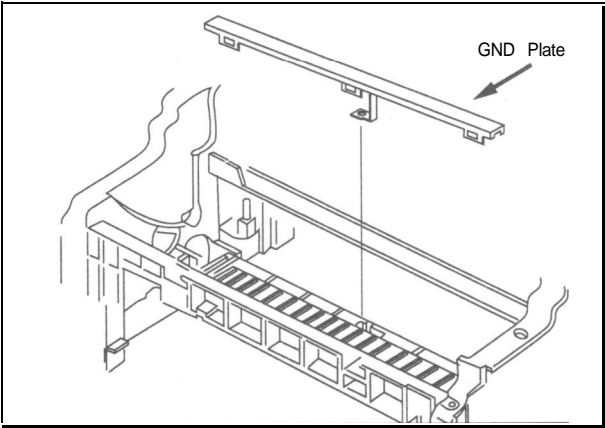


Remove the transfer roller holder, transfer roller spring, and inner transfer roller bushing.

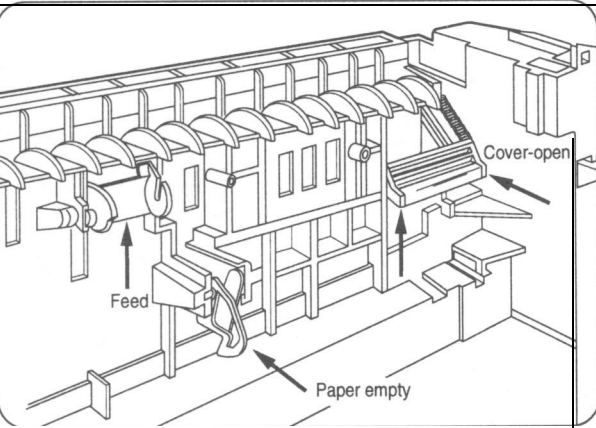
# 5-13. GND Plate Disassembly



Unscrew at the guide transfer. Locate the 3-point locking of the transfer roller ground plate.

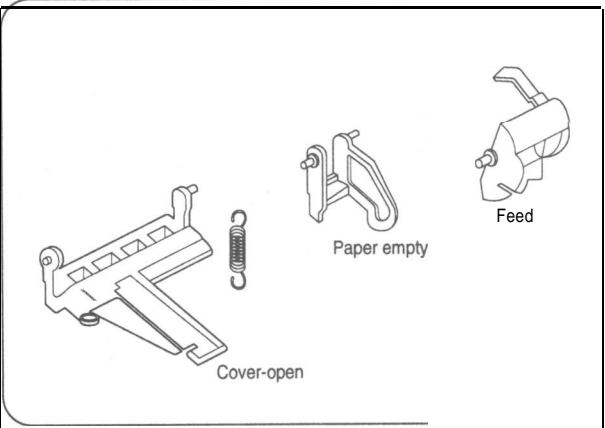


Lift the transfer roller ground plate by widening the frame and the transfer roller ground plate stopper. remove the ground plate.



Carefully lift the feed-sensor actuator and remove it from its holder. Both sides of the actuator are locked to holders.

In a similar manner, remove the paper empty actuator.



Release and lift out the feed sensor, paper empty sensor and cover open sensor.

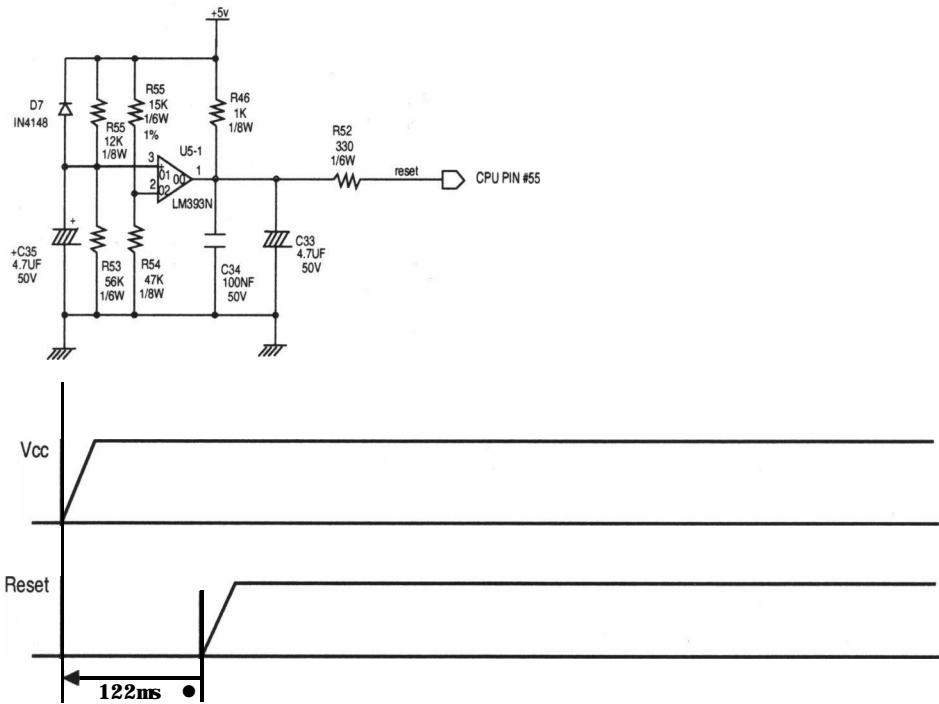
# 6. Special Circuit Description

## 6-1. Engine Control Board

### 6-1-1 Main Parts

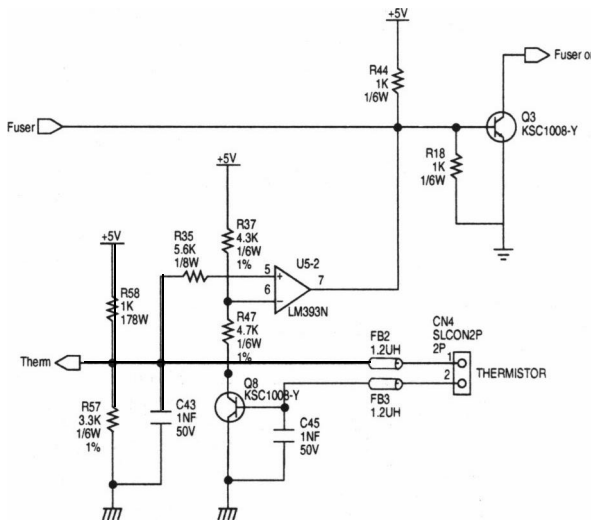
#### 6-1-1-1 Reset Operation

Reset circuit initializes CPU when power is turned on and prevents CPU from unstable operation caused by unstable power source. It consists of comparator IC LM393, resistors and condensers which determine reset timing. When dc 3.8V or higher voltage is applied to #3 pin of LM 393, RESET signal goes HIGH and CPU starts initialize operation.



#### 6-1-1-2 Fuser Temperature Control

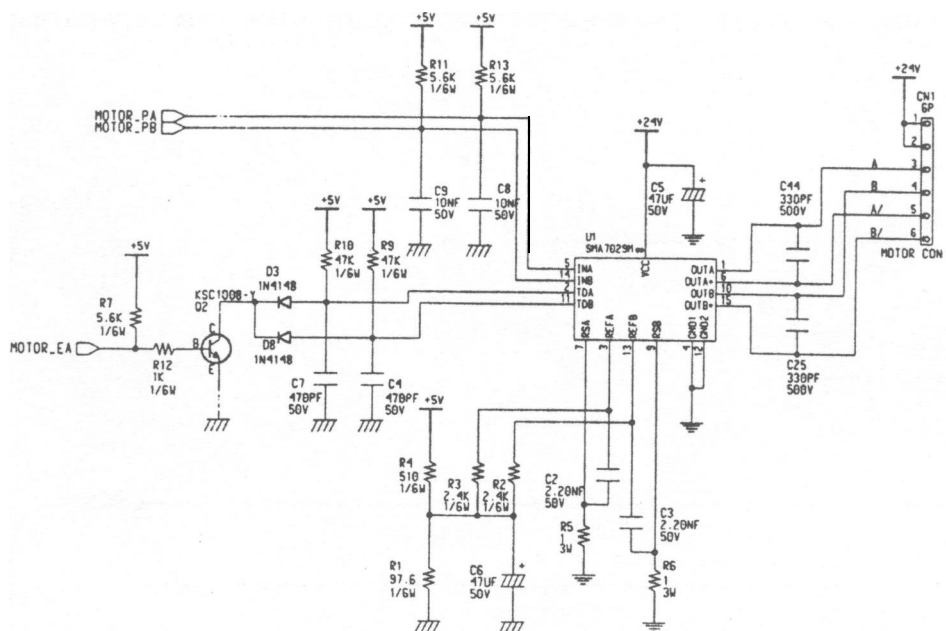
Fuser temperature control circuit reads thermistor voltage through CPU pin #45 (P5.0) and turn on or off fuser through CPU pin #38 (P6.4) and transistor Q3 (KSC945) according to thermistor value. Thermistor is device whose resistance changes according to temperature of heat roller. As temperature increases, the resistance of thermistor decreases. LM393 is used for preventing heat roller from overheating.



### 6-1-1-3 Motor Driving Circuit

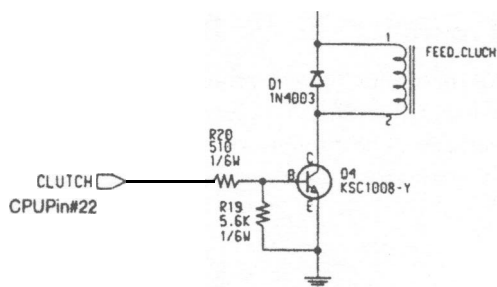
SLA7029M receives phase signal from CPU and generates **plused** signal for main motor driving and controls driving currents through R5 and R6.

It adopts constant current unipolar driving method



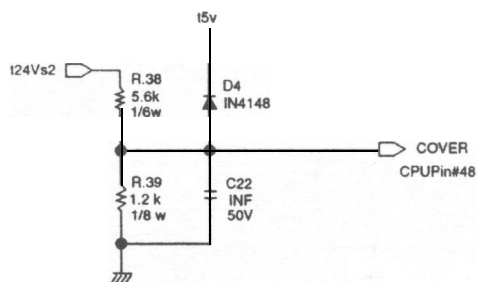
### 6-1-1-4 Solenoid Driving Circuit

Solenoid controls the paper pick up clutch. It is operated on +24V and control signal from CPU #22 pin (P3.2). Q4(KSC 1008) is driver transistor and D 1 (IN4003) protects Q4 from switching off noise pulse.



### 6-1-1-5 Cover Open Sensing

When cover is closed, CPU pin #48 (P5.3) is HIGH, Otherwise Pin #48 is LOW.



### 6-1-1-6 Sensor

There are three sensor – Feed Sensor, Exit Sensor and Paper Empty sensor.

1) Feed Sensor

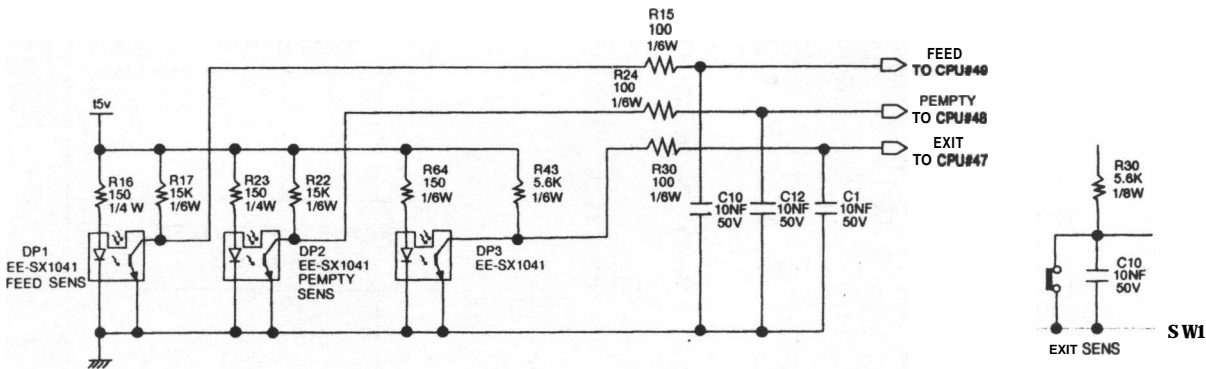
Feed sensor type is Photo Sensor. Feed sensor is connected to CPU pin #46 (P5.1) through R15. If paper is on feed sensor, sensor state is LOW, otherwise sensor state is HIGH.

2) Exit Sensor

Exit sensor type is leaf switch. Exit sensor is connected to CPU pin #47 (P5.2) through R30. If paper is on exit sensor, sensor state is LOW, otherwise sensor state is HIGH.

3) Paper Empty Sensor

Paper empty sensor type is Photo sensor. Paper empty sensor is connected to CPU pin #49 (P5.4). When there is no paper in cassette, sensor state is HIGH, otherwise sensor state is LOW.



### 6-1-2 Interface Specification

#### 6-1-2-1 Overview

SAMSUNG LASER BEAM PRINTER (called ENGINE) can be connected to the image control device (called CONTROLLER) with the interface through which they check their status and control the printing sequence and image data. The ENGINE transposes the received image data from the CONTROLLER into visible image on paper.

There are two kinds of interface signal as follows.

1) STATUS SIGNAL

/READY indicates whether the ENGINE is ready to print, or not.  
/CMSG is the command data from the CONTROLLER, /EMSG is the status data from the ENGINE as response for the command data. Both are controlled by /CCLK, /CBSY, and /ESBY signals.

2) IMAGE SIGNAL

PRINT makes the ENGINE pick up a paper to print the image data from the CONTROLLER.  
The synchronized image data (called /VDATA) by /PSYNC vertically and /HSYNC horizontally is sent to the ENGINE by video clock of the CONTROLLER.  
/EXITPAP indicates that the previous paper clears the exit sensor.

6-1-2-2 Structure

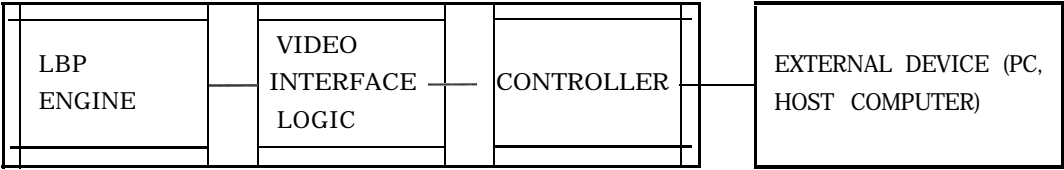


Fig. 6-1-1 System Block Diagram

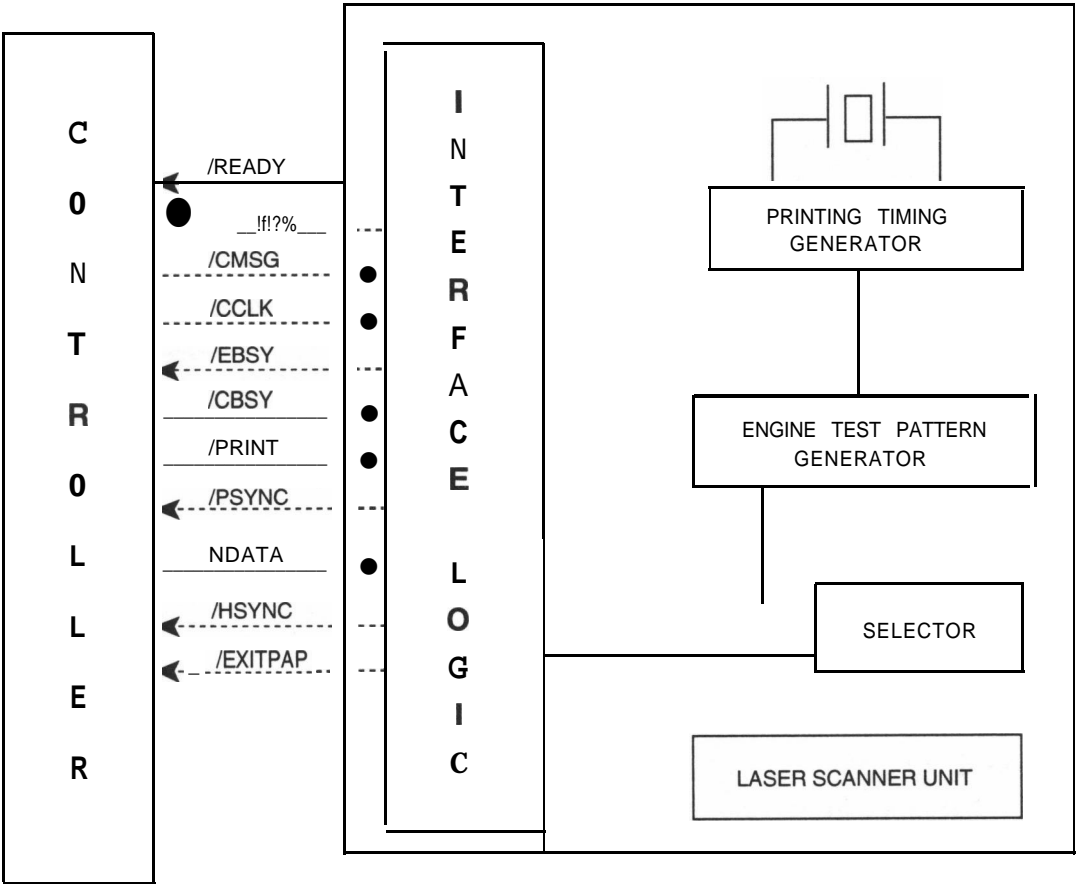


Fig. 6-1-2 Interface Block Diagram



6-2. SMPS

6-2-1 SMPS SPEC

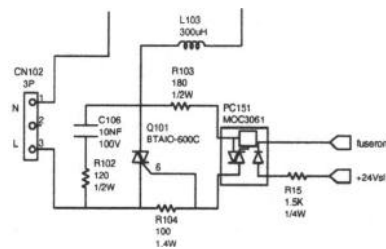
	NO	ITEM	SPEC	REMARK
INPUT	1	INPUT AC NOMINAL MINIMUM MAXIMUM	220VAC/120VAC 198VAC/90VAC 264VAC/132VAC	
	2	INPUT AC CURRENT	MAX 1.5A/2.5Arms	include the heater current
	3	INRUSH CURRENT (20 DEGREE)	MAX 35A P-P	
OUTPUT	4	LINE REGULATION 24V 5V	24v ±3% 5V +2%	
		LOAD REGULATION 24V 5V	24V -3%~+10% 5V 3%	
		RIPPLE NOISE 24V 5V	120mv 50mV	PEAR 400mV PEAR 100mV
		O.C.P 24V 5V	2.7A±10% 5A(FUSE)	
	5	O.V.P 25V 5V	33 v 5.6V	

6-2-2 The SMPS supplies two different DC voltage sources, +5V and +24V

OUTPUT	APPLICATION	REMARK
+5V	1. Logic Parts 2. LSU	Engine Board Controller Board, Panel
+24V	1. Main Motor 2. Solenoid 3. HVPS 4. Heater Input Drive 5. LSU motor	Pickup Clutch
AC INPUT	1. Heat Lamp	

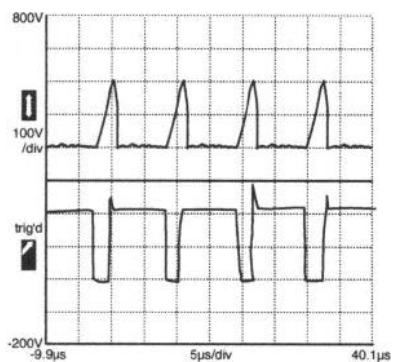
6-2-3 Fuser Control circuit

Fuser controlled by the "fuser on" signal.  
When the fuser on signal rises triac in the Photo Triac (pc151) is turn on.  
Then trigger input signal supplies into the gate of the Triac (Q101) Triac is turn on.

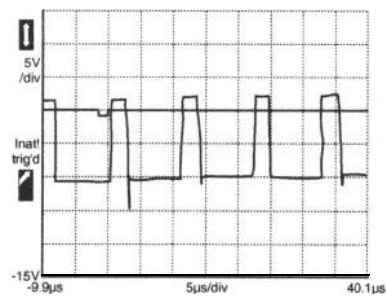


### 6-2-4 Switching control

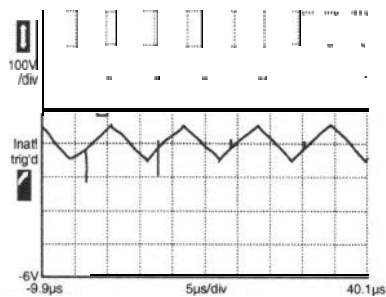
When power is turn on, starting current flows into the UIOI(pin6) passing through ZD101(R106) and R107. The IC's totem-pole output can directly drive the MOSFET(Q102).  
If the supply voltage drops, the IC shuts its output down when VCC=8.7V.  
When the under voltage lockout circuit operates, the CS pin goes low to reset the IC.  
Refer to power device data book (related document).



Current/voltage waveform of the FET(Q 102)



Output waveform of the **U10** (pin5)



Waveform of the UIOl(pin7)

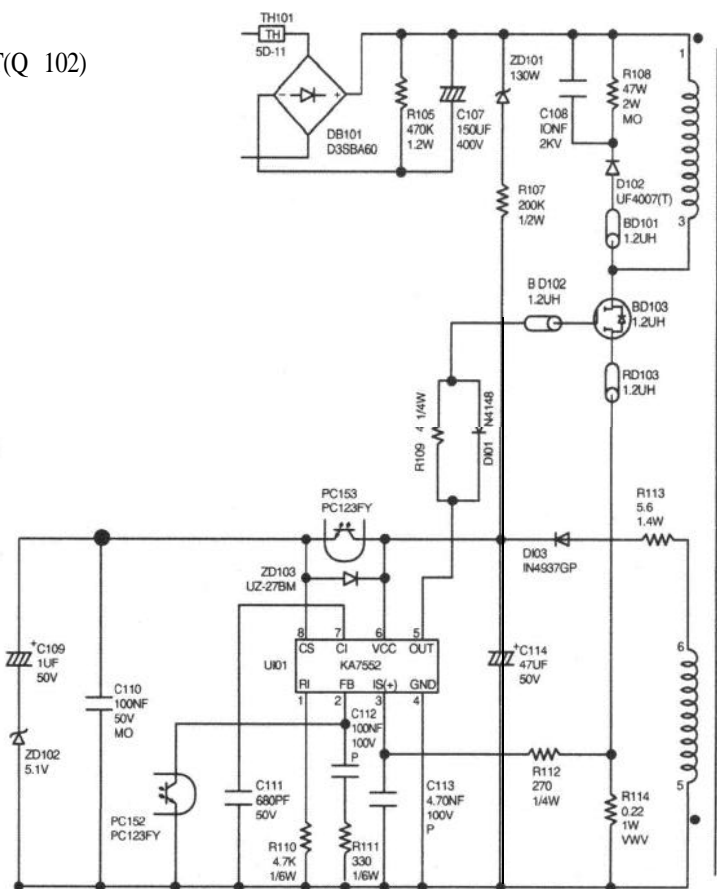


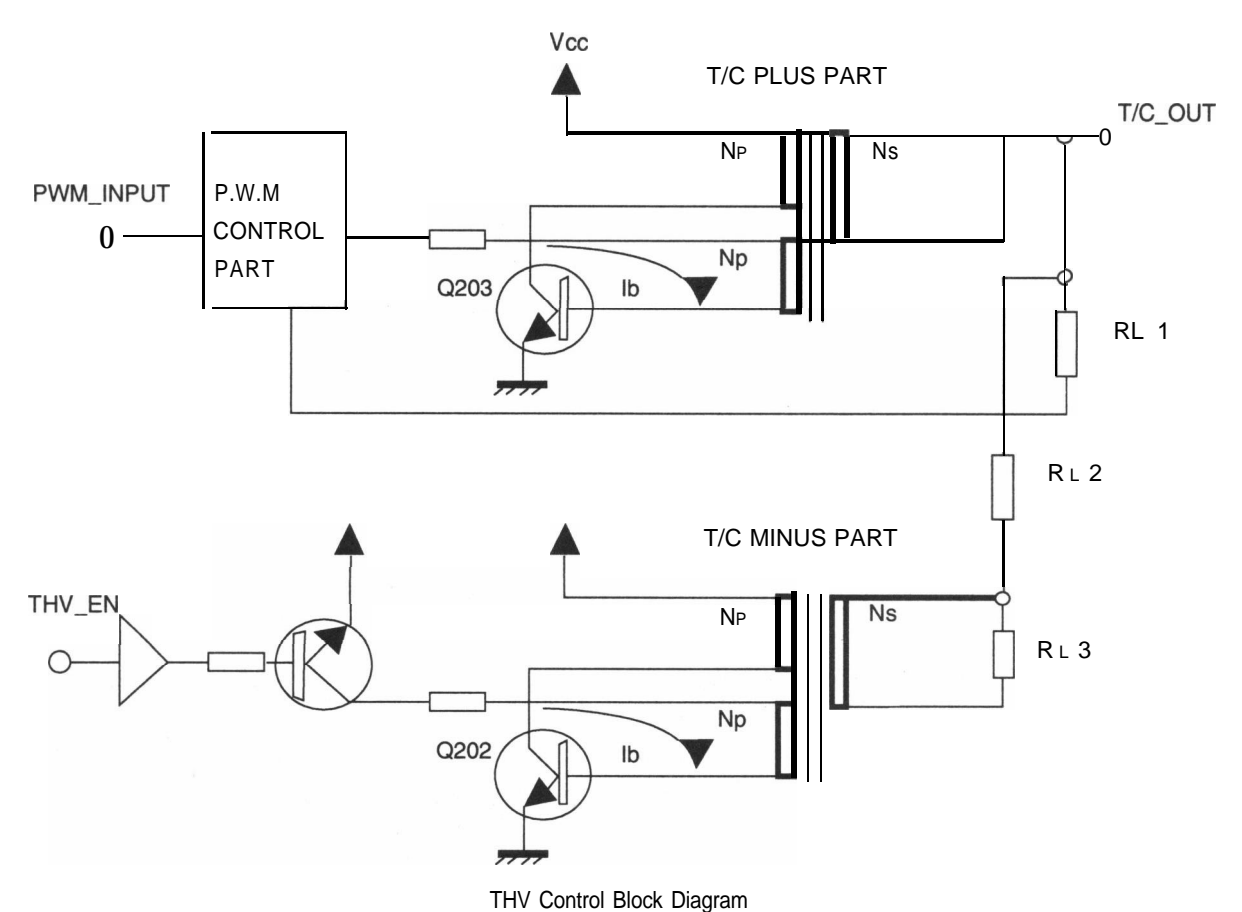
Fig. 1-3 Switching Control Block Diagram

# 6-3 HVPS

## 6-3-1 OUTPUT SPEC

	PRINTING/INITIAL	DCU	REMARK
BIAS/SUPPLY	-380V	-380V	
THV "-"	-1K V	-1KV	
THV "+"	variable	+975V	by the operating environment EX) temperature, humidity
MHV	-1.4KV	-1.4KV	

## 63-2 Transfer High Voltage Unit



THV output is constituted "+" output and "-" output. "-" output is for clean the OPC drum. "+" output use is for draw toner on the paper.

When the THV enable is low, the switching TR (Q202) is turned on and "-" output is generated. Soon the switching TR (Q203) is supplied PWM input, "+" output is duplicated to "-" output in accordance with Q203 turn on.

The fundamental principle of the BIAS/MHV output control is similar to the THV output control.

# 6-4. VIDEO CONTROLLER

The chapter presents the features offered by this printer and describes the electrical operation of the ML-85 Laser Printer Video Controller, which includes the following topics.

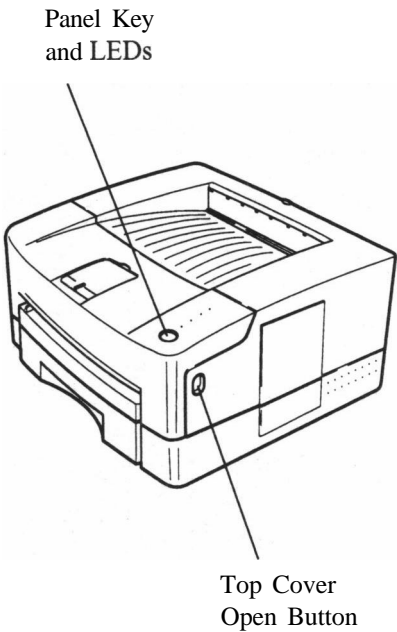
- CPU (MC68322/XC68322FT20) -- Note that the 85G series does not have the CPU.
- ROM (Program and Font) -- Note that the 85G series does not have the ROM.
- \*DRAM
- EEPROM
- Display panel interface
- Engine interface
- Parallel interface

For a more detailed description of printer operations, refer to *Operator’s Guide*.

## 641 Print Panel Display

The ML-85 Laser Printer Video Controller uses the following light sequences to keep you informed of the current status of the printer.

<b>READY</b> Green LED	Steady On	Online and ready to print
	Blinking	Receiving data, processing, or printing
	Double Blink ever 2-3 secs	Waiting with data in printer
<b>PAPER</b> Amber LED	Blinking	Paper Out
	Steady on, (with ERROR on steady)	Paper Jam
<b>MANUAL</b> Amber LED	Blinking	Manual Feed
	Steady On (with ERROR on)	
<b>ERROR</b> Red LED	Blinking	Recoverable error, press button to continue or wait timeout.
	Steady on (with ERROR on)	Unrecoverable error, or cover open
<b>POWER</b> Green LED	Power on indicator (ML-85G and QwikLaser 85G only)	



### From Feed function:

With the printer ONLINE and the READY LED blinking or Double Blinking; pressing and holding the KEY button down for 4 seconds will cause the printer to print any data remaining in the printer’s memory.




### NOTE :

There is no function of key at ML-85G (QwikLaser 85G).

6-4-1 -1 Model Comparison

Cabinet Item	OLD Cabinet		New Cabinet	
	ML-85 or QwikLaser 85	ML-85G or QwikLaser 85G	ML-85 plus	ML-85G plus
1. Top Cover &	Old type 4 LEDs, 1 key	Advancedold type NEW 5 LEDs	NEW 4 LEDs, 1 key	NEW 4 LEDs only
2. Controller Board	ML-85	ML-85G ML-85G is not R61 and EEPROM. QwikLaser 85G is R61 and EEPROM	ML-85	ML-66G-t ML-85G plus is not R61 and EEPROM.
3. Setup Driver Cart on/	ML-85, QwikLaser85	ML-85G, QwikLaser 85G	ML-85 plus	ML-85G plus

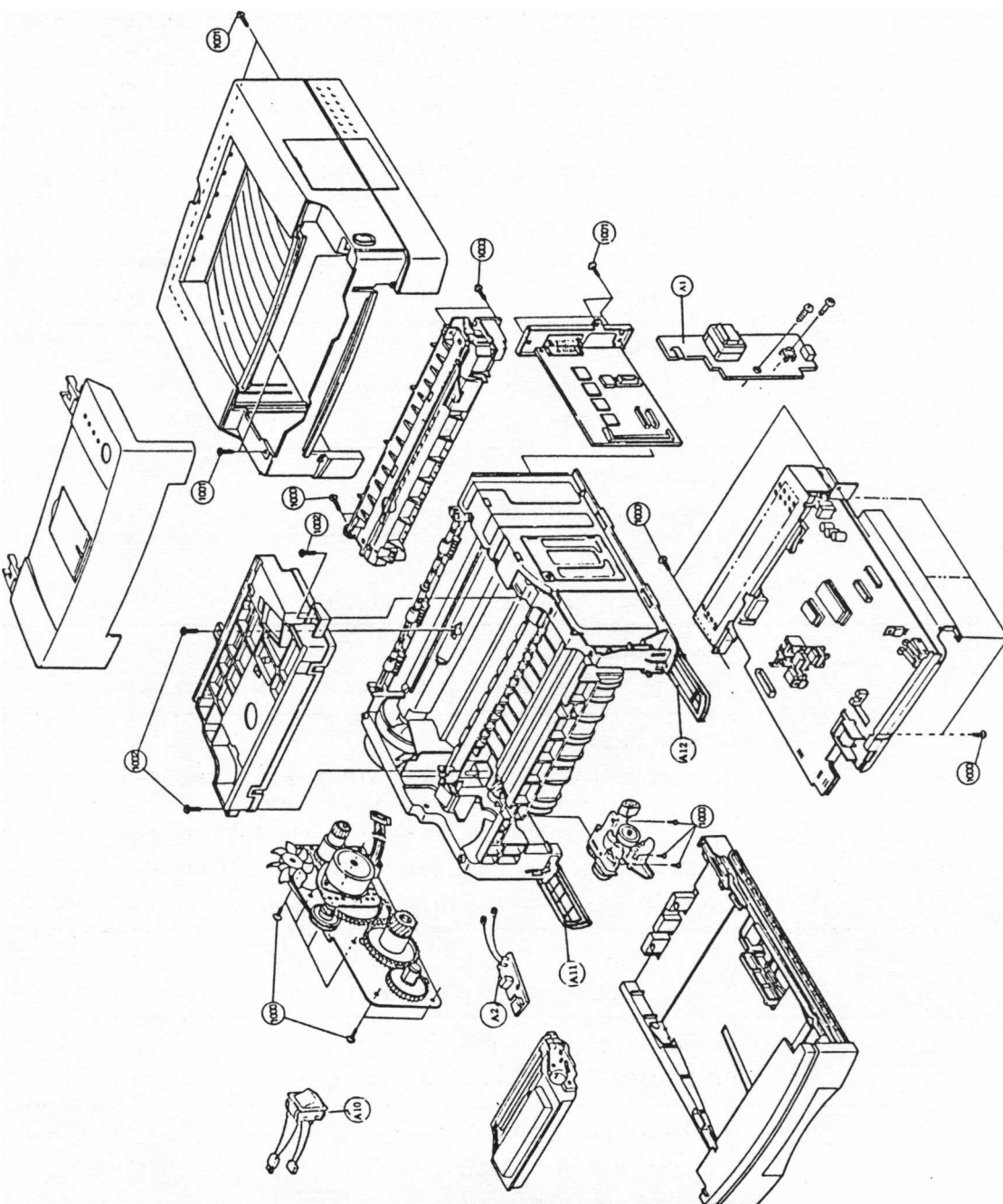
6-4-1-2 OP Panel Layout

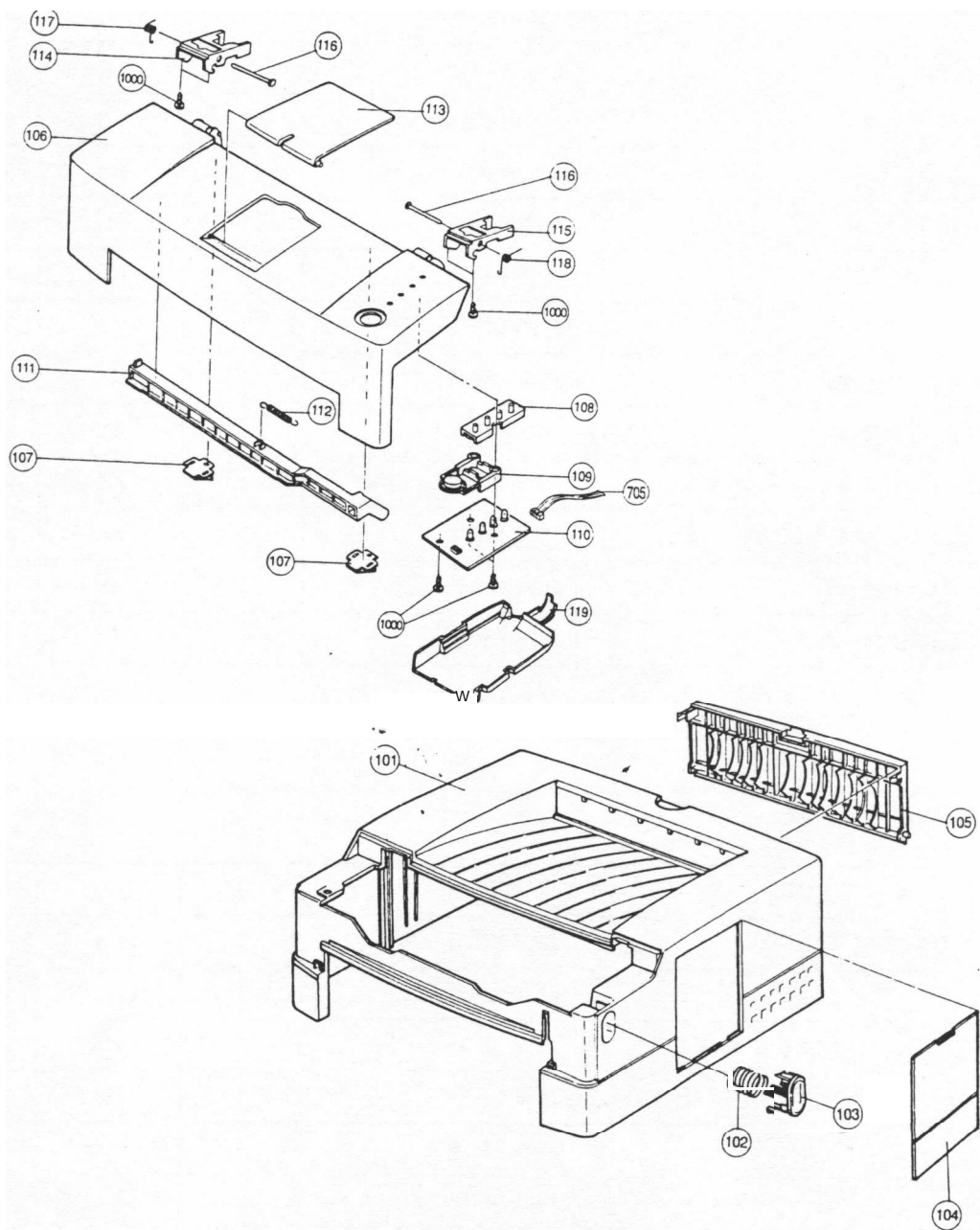
ML-85 or QwikLaser 85	ML-85G or QwikLaser 85G	ML-85 plus	ML-85G plus
<div><div><div>○ ERROR (Red)</div><div>○ MANUAL (Yellow)</div><div>○ PAPER (Yellow)</div><div>○ READY (Green)</div><div></div></div></div>	<div><div><div>○ ERROR (Red)</div><div>○ MANUAL (Yellow)</div><div>○ PAPER (Yellow)</div><div>○ READY (Green)</div><div>○ POWER (Green)</div></div></div>	<div><div><div>○ ERROR (Red)</div><div>○ MANUAL (Yellow)</div><div>○ PAPER (Yellow)</div><div>○ REAOY (Green)</div><div></div></div></div>	<div><div><div>○ ERROR (Red)</div><div>○ MANUAL (Yellow)</div><div>○ PAPER (Yellow)</div><div>○ READY (Green)</div><div></div></div></div>

### 7-3-2 Troubleshooting Table of Video Controller Board(ML-84/85/85G)

No	Error Type	Check List	Repair
1	Power Error	Power cord connection	Connect the power cord.
		Vcc voltage (nominal is +5V) level. Vcc voltage should be in the range between +4.8~+5.2V An engine power supply (SMPS) is operating by hearing the rotating sound of fan after connecting the power cord. The engine power supply AC and 5V output fuse in engine power supply unit after power off.	Replace SMPS unit. Refer to the section of engine trouble shooting. Replace the fuse.
2	Cable Error	Mutual connection of engine, panel connector cable (7 pin) and engine interface cable (24 pin). The pins of connector is straight.	Connect the cable to the connector.
3	Main Board Error (Video Controller Board)	Any component damage on a video controller board.	Repair or replace it with appropriate tools. If unable to do this, replace main board.
		Any foreign conductive chips of solder or material is on the video controller board or is laid between IC pins after power off.	Remove any foreign conductive chips on the video controller board.
4	Reset Error	■ Reset signal. Normally high during operation.	
5	CPU Clock Error	40.0Mhz	TTL compatible input
6	Video Clock Error	30.075Mhz	TTL compatible input
7	Panel Error	<ul style="list-style-type: none"> <li>Check the connection of panel cable.</li> <li>Check the panel PCB assembly.</li> </ul>	
8	DRAM Error	<ul style="list-style-type: none"> <li>Check the DRAM address signals.</li> <li>Check the DRAM data signals.</li> </ul>	
9	EEPROM Error	<ul style="list-style-type: none"> <li>Check the EEPROM clock signals.</li> <li>Check the EEPROM data signals.</li> </ul>	
10	ROM Error	<ul style="list-style-type: none"> <li>Check the ROM chip select signals and read signal.</li> <li>Check the ROM data signals.</li> </ul>	
11	Engine Error	<ul style="list-style-type: none"> <li>Fusing Unit Error :thermister, heat lamp, etc.</li> <li>Engine communication error : Video controller can not communicate with engine PCU board about the status of the engine such as paper jam, paper empty, ready, etc.</li> <li>Check the connection of engine interface cable.</li> <li>Replace the video board by the verified board, and check the operation of printer.</li> </ul>	Messages appear on PC screen. At first turn off printer than turn it on again. Refer to engine trouble shooting section.
12	Parallel Interface Error	■ Check the operation of printer driver.	Refer to User's manual
		■ Check the printer cable (bidirectional function?)	Replace the printer cable.
13	Engine Related Problems	<ul style="list-style-type: none"> <li>Please refer to the ML-85 engine service manual about the following. <ul style="list-style-type: none"> <li>Thermal Error</li> <li>No heating</li> <li>Over heating</li> <li>LSU beam Error</li> <li>Scanner Error</li> <li>Fixing Assy Error</li> </ul> </li> </ul>	Messages appear on PC screen. At first turn off printer then turn it on again.
14	General descriptions of troubleshooting	<ul style="list-style-type: none"> <li>Please refer to the user's manual.</li> <li>If you can not fix the trouble of video controller board, replace the video board by the verified board.</li> </ul>	Replace the board.

## 8. Exploded Views & Parts List



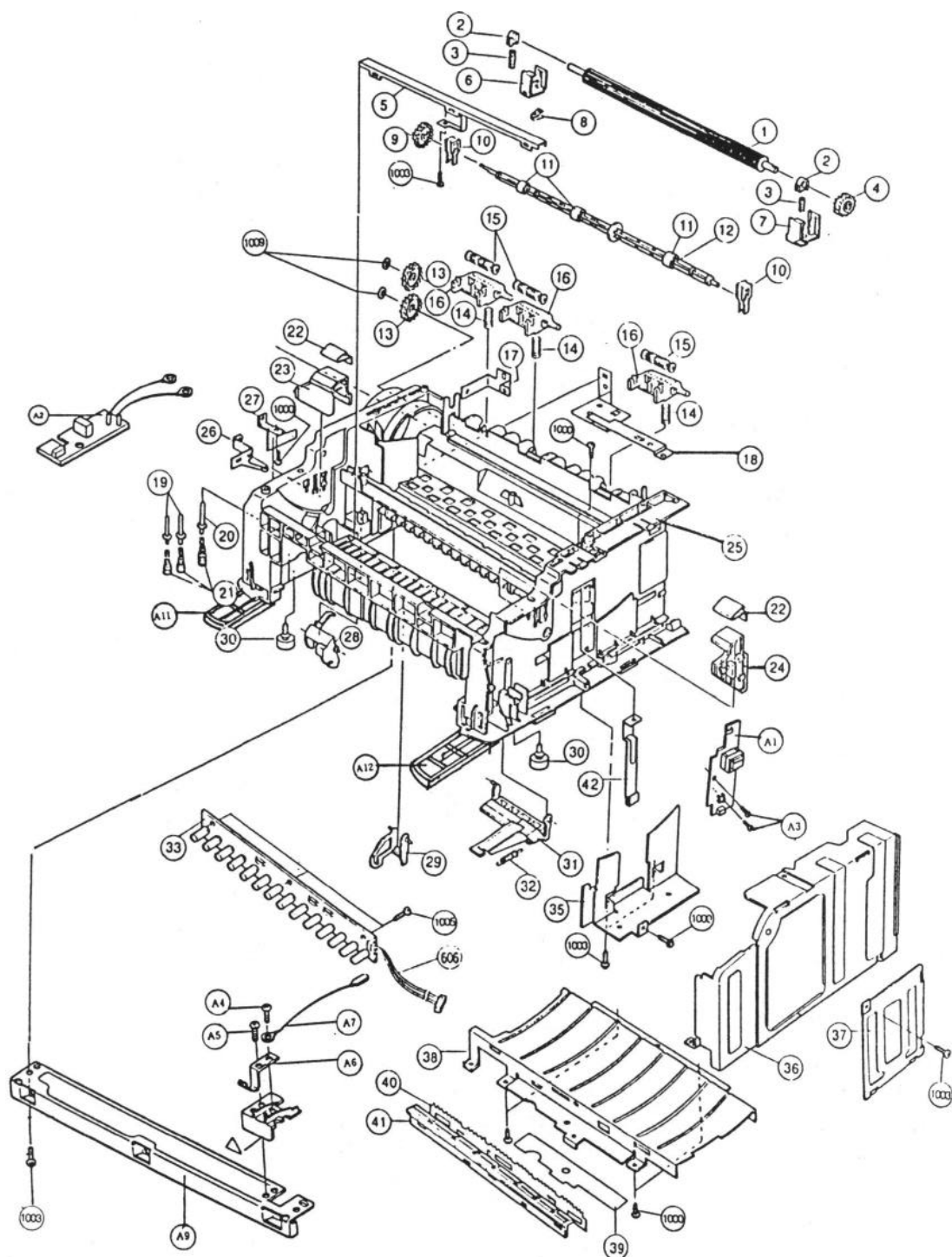




# 8-1 Cover & Panel Ass'y

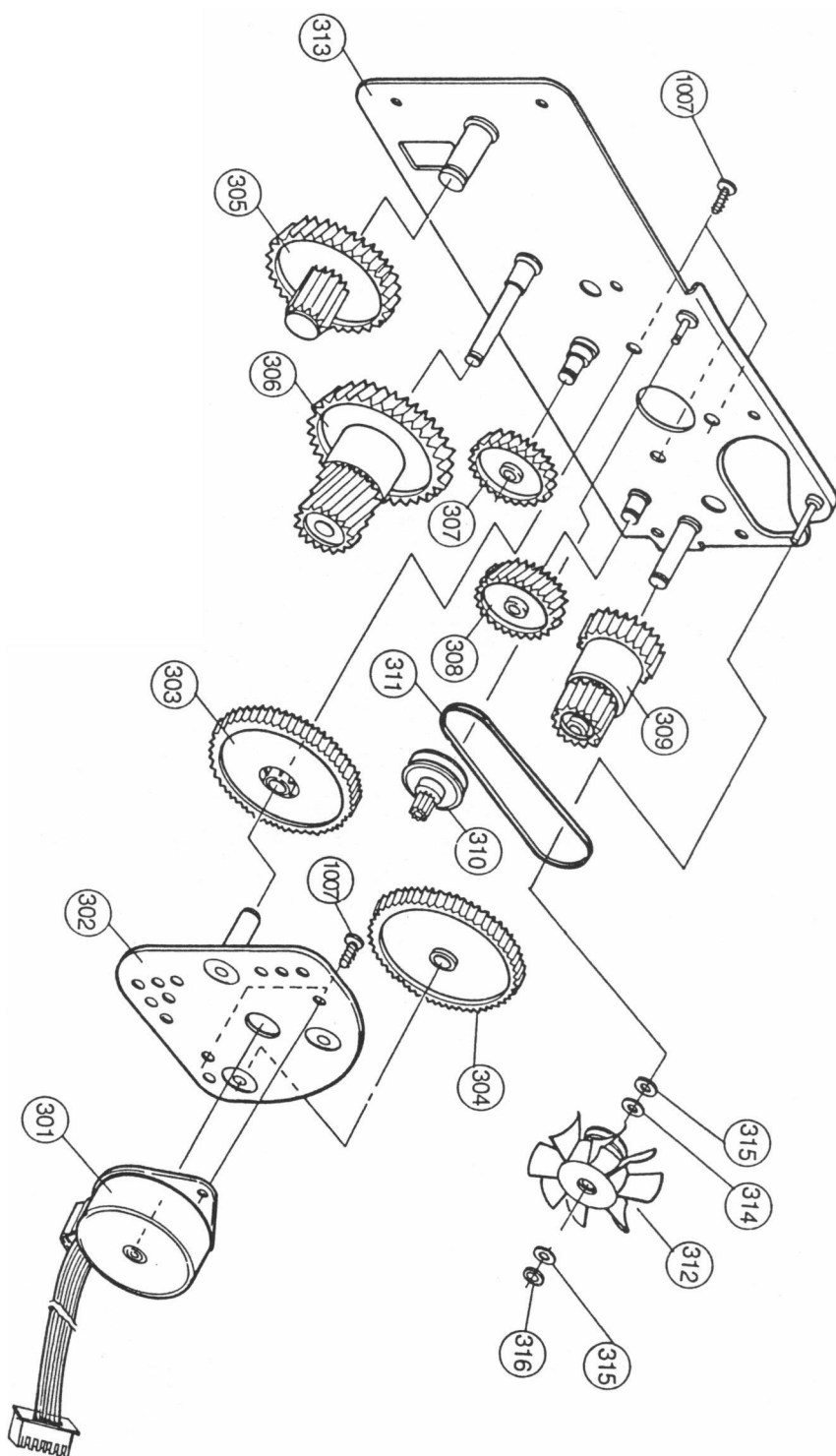
☐ or ☒ A/S (After Service) enable    ☐ A/S disable

No.	Description	Code No.	Q'ty	Drw No.	A/S
1	PMO-COVER MAIN	JC72-40922A	1	101	<input checked="" type="checkbox"/>
2	SPRING-CS:PI0.7,D12.4	6107-000117	1	102	<input checked="" type="checkbox"/>
3	PMO-BUTTON_C/O	JC72-40336A	1	103	<input checked="" type="checkbox"/>
4	PMO-COVER_SIMM	JC72-40329A	1	104	<input checked="" type="checkbox"/>
5	PMO-COVER_EXIT	JC72-40343A	1	105	<input checked="" type="checkbox"/>
6	MEC-HOUSING,COVER:QL-84	JC75-10918A	1	106	<input checked="" type="checkbox"/>
	MEC-HOUSING,COVER:QL-85	JC75-10935A	1	106	<input type="checkbox"/>
	MEC-HOUSING,COVER:QL-85G	JC75-10934A	1	106	<input type="checkbox"/>
	MEC-HOUSING,COVER:ML-84	JC75-10918X	1	106	<input checked="" type="checkbox"/>
	MEC-HOUSING,COVER:ML-85	JC75-10918M	1	106	<input type="checkbox"/>
	MEC-HOUSING,COVER:ML-85 PLUS	JC75-10926A	1	106	<input type="checkbox"/>
	MEC-HOUSING,COVER:ML-85G	JC75-10918S	1	106	<input checked="" type="checkbox"/>
	MEC-HOUSING,COVER:ML-85G PLUS	JC75-10927A	1	106	<input type="checkbox"/>
7	PMO-BUTTON_PANEL:ML-84/85,QL-84/85, ML-84/85/85G PLUS	JC72-40365A	1	109	<input type="checkbox"/>
	PMO-BUTTON_PANEL:ML-85G,QL-85G	JC72-40356B	1	109	<input checked="" type="checkbox"/>
8	PBA-PANEL,4LED:ML-84/85,QL-84/85, ML-84/85//85G PLUS	JC92-00346A	1	110	<input checked="" type="checkbox"/>
	PBA-PANEL,5LED,NO KEY:ML-85G,QL-85G	JC94-00985A	1	110	<input type="checkbox"/>
9	PMO-LEVER_HOOK	JC72-40325A	1	111	<input checked="" type="checkbox"/>
10	SPRING-ES	6107~133	1	112	<input checked="" type="checkbox"/>
11	PMO-STACKER_SUB:ML-84/85/85G,QL-84/85/85G	JC72-40335A	1	113	<input checked="" type="checkbox"/>
	PMO-STACKER_SUB:ML-84/85/85G PLUS	JC72-40335A	1	113	<input checked="" type="checkbox"/>
12	HINGE-HSGL	JC61-80200B	1	114	<input checked="" type="checkbox"/>
13	HINGE-HSG R	JC61-80200A	1	115	<input type="checkbox"/>
14	IPR-SHAFTCOVER OPEN	JC70-10228A	1	116	<input type="checkbox"/>
15	COM,SPRINGC/O,L	831 523031CB	1	117	<input checked="" type="checkbox"/>
16	COM,SPRINGC/O,R	831 523031CA	1	118	<input checked="" type="checkbox"/>
17	PMO-CAP_PANEL WIRE:ML-84/85/85G,QL-84/85/85G	JC72-40334A	1	119	<input checked="" type="checkbox"/>
	PMO-CAP_PANEL WIRE:ML-84/85/85G PLUS	JC72-41056A	1	119	<input checked="" type="checkbox"/>
18	SCREW-TAPTITE:PW,+,B,M3	6003-000002	1	1000	<input checked="" type="checkbox"/>



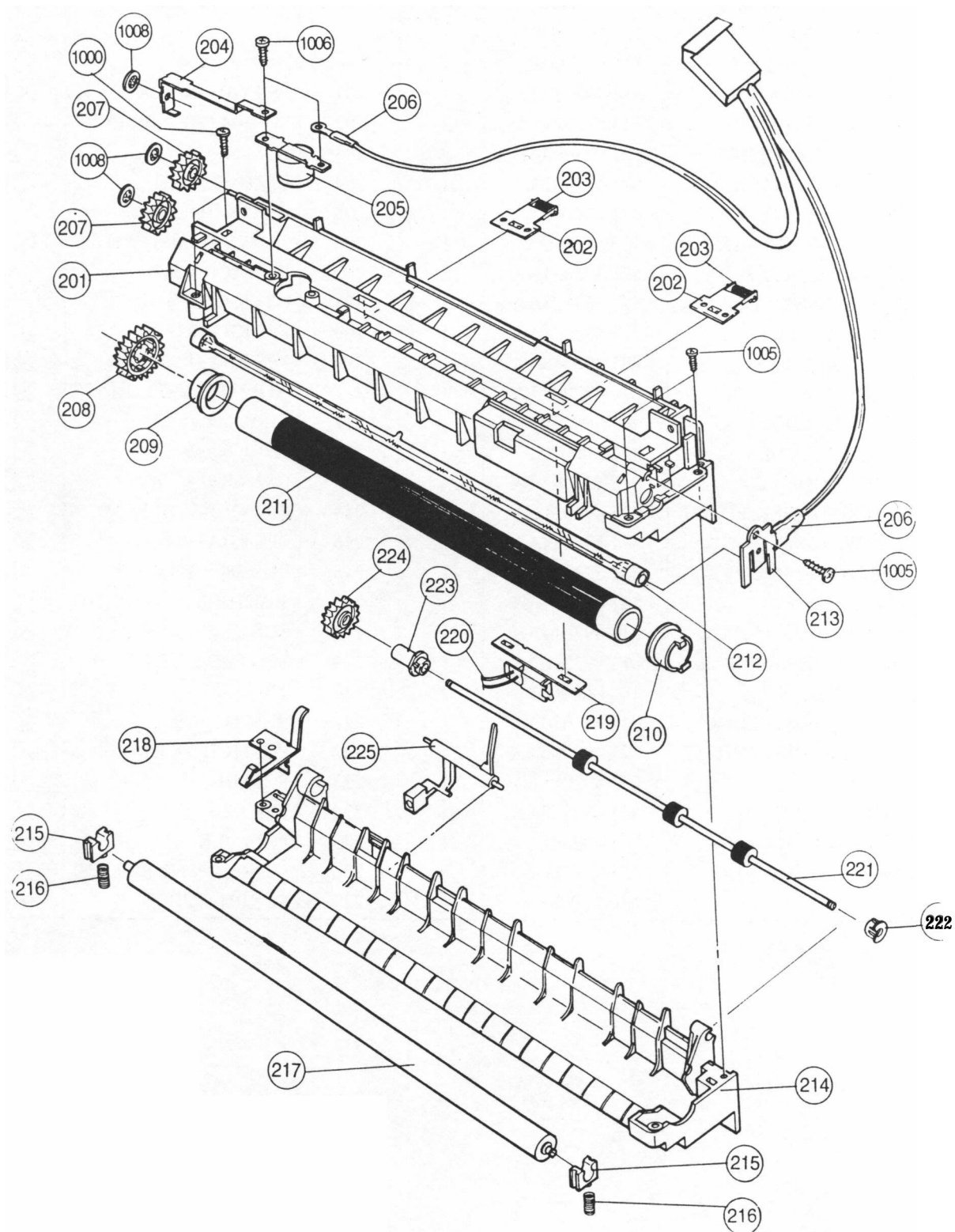
## 8-2 Assy Frame Parts List

No.	Parts Name	Code No.	Qty	Drw No.	Material	A/S
1	ROLLER-TRANSFER	811 492004AA	1	1	CLOROHYDRINE 발포	☒
2	BUSH TR INNER	821 492008AA	2	2	POM (CE-20), BLK	☒
3	SPRING T/R, L	83 1 522060BA	2	3	SUS304 WPS, $\phi$ 0.5	☒
4	GEAR-TRANSFER	821 492054AA	1	4	POM BLK	☒
5	GND-TRANSFER, PLATE	813 492011AA	1	5	SUS304 to.3	☒
6	HOLDER-TR BEARING, L	821 492080AA	1	6	PC BLACK	☒
7	HOLDER-TR BEARING, R	821 492080AA	1	7	PC BLACK	☒
8	SPRING PLATE TR	813 492025AA	1	8	SUS304 CSP 3/4H, t0.2	☒
9	GEAR-EXIT	821 492030AA	1	9	DURACON M90	☒
10	BEARING-EXIT, F/DOWN	811 492007AA	2	10	POM NTR	☒
11	RUBBER-EXIT	821 492081AA	3	11	EPDM 60"	☒
12	SHAFT-EXIT	821 492074AA	1	12	ABS GF20% BLK	☒
13	GEAR-EXIT/U, ID	821 492032AA	2	13	DURACON M90	☒
14	SPRING-EXIT, F/DOWN	83 1 522050DA	3	14	SUS304 WPB, $\phi$ 0.5	☒
15	ROLLER-EXIT	821 492054AA	3	15	POM BLK	☒
16	HOLDER-EXIT, F/DOWN	821 492054AA	3	16	ABS GF20% BLK	☒
17	EARTH PLATE FU	8 13 49200AA	1	17	SUS CPS3/4H t0.2	☒
18	GROUND G/TR	JC70- 10008A	1	18	SUS301 CSP 1/2H TO.2	☒
19	TERMINAL H/V 2	935 810040AA	2	19	SUM 24L Ni	☒
20	TERMINAL H/V 1	935 8 10040BA	1	20		☒
21	SPRING H/V	83 1 522042JA	3	21	SUS304 WPB \$0.4	☒
22	SPRING-PLATE G/DEV	JC61-70001AA	2	22	SUS304 CSP3/4H, t0.2	☒
23	GUIDE-DEV, L	JC61-20001AA	1	23	POM BLK	☒
24	GUIDE-DEV, R	JC61-20003AA	1	24	POM BLK	☒
25	FRAME-BASE	JC72-60011A	1	25	ABS VO GF20% BLK	☐
26	GROUND-OPC	813 492013AA	1	26	SUS304 CSP3/4H t0.2	☒
27	GROUND MOTOR	JC70-10007A	1	27	SUS301 CSP 1/2H TO.2	☒
28	ACTUATOR-FEED	821 492003AA	1	28	ABS HB BLK	☒
29	ACTUATOR-EMPTY	821 492002AA	1	29	ABS HB BLK	☒
30	FOOT-RUBBER	831 313026AA	2	30	CR60 VO GRAY	☒
31	ACTUATOR C/O	821 492089AA	1	31	ABS VO BLK	☒
32	SPRING C/O SENSOR	831 521073AA	1	32	SUS304 WPB $\phi$ 0.3	☒
33	ASSY-ERASE, LAMP	JC93-20007A	1	33	—	☒
34	BKT-ERASE	JC70-10002A	1	34	SECC, t0.5	☒
35	GROUND-ICU	JC70- 10006A	1	35	SECC T=0.8	☒
36	SHIELD-ICU	813 492021AA	1	36	SECC t0.5	☒
37	SHIELD-COVER SIMM	813 492034AA	1	37	SECC t0.5	☒
38	GUIDE-TRANSFER	813 492016AA	1	38	SECC t0.6, 흑도장	☒
39	INSULATOR-G/TR	JC72- 10002A	1	39	PVC LS080 SHEET t0.3	☒
40	PLATE-SAM	813 492057AA	1	40	SUS304 CSP to.1	☒
41	HOLDER-SAM PLATE	821 492057AA	1	41	PC BLK	☒
42	SHIELD-CAP WIRE	JC70-10003AA	1	42	SECC, t0.6	☒



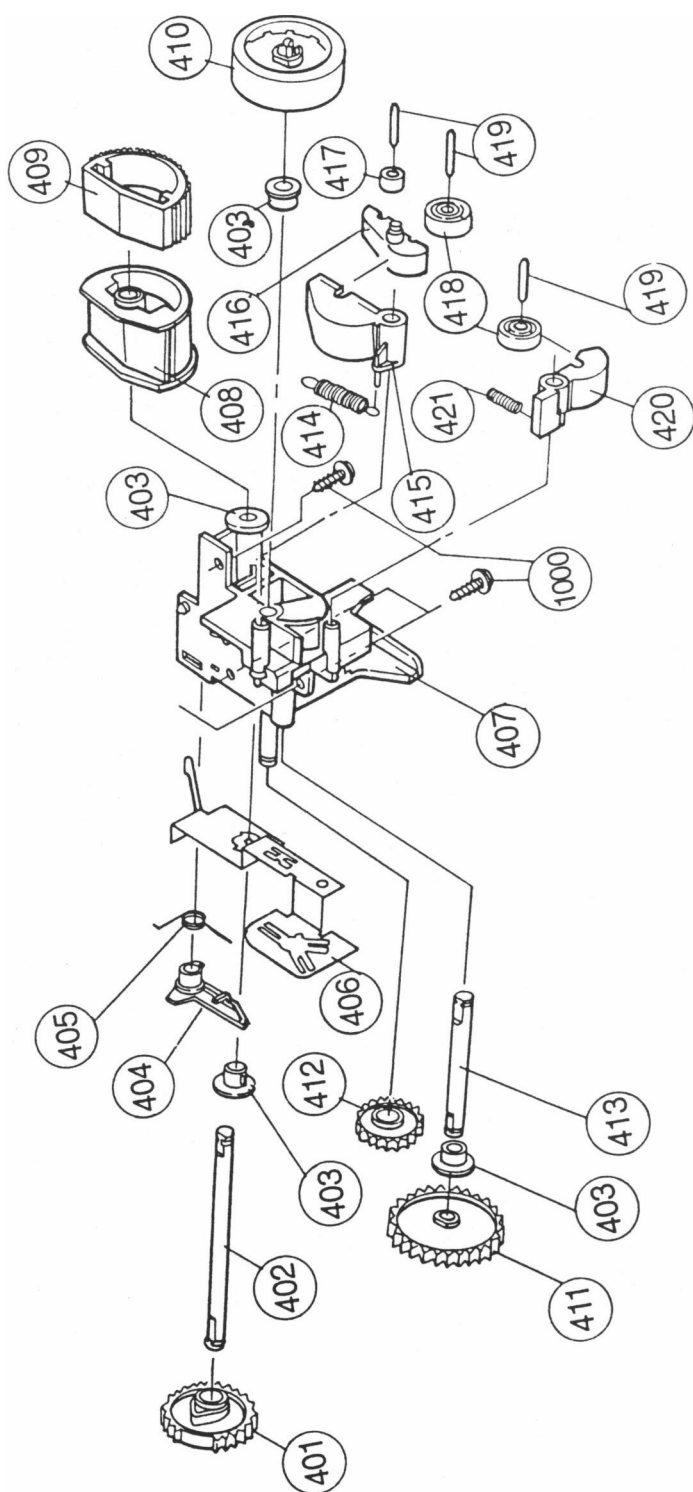
### 8-3 Assy Motor Parts List

NO.	Parts Name	Code No.	Qty	Dtw No.	Material	A/S
1	ASSY-MOTOR	JC92-60004A	1	—	—	☒
2	STEP-MOTOR	953 280066AA	1	301	PM TYPE(7.5°)	☒
3	BRACKET-MOTOR	813 492017AA	1	302	SECC t1.2	☐
4	GEAR- 132125	821 402026AA	1	303	DURACON M90	☒
5	GEAR-125/18	821 492025AA	1	304	DURACON M90	☐
6	GEAR-FEED DRV	821 492034AA	1	305	DURACON M90	☒
7	GEAR-OPC DRV	821 402030AA	1	306	DURACON M90	☒
8	GEAR-IDLE OPC	821 492036AA	1	307	DURACON M90	☒
9	GEAR-IDLE, FU	821 492038AA	1	308	POM SW-01	☒
10	GEAR-FUSER, DRIVE	821 492035AA	1	309	DURACON M90	☐
11	GEAR PULLEY	821 492024AA	1	310	DURACON M90	☒
12	BELT IMPELLER	831 721004DA	1	311	EPDM	☒
13	ASSY IMPELLER	811 721004DA	1	312	PULLEY/IMPELLER/BEAR	☒
14	BRACKET-GEAR	813 492001AA	1	313	SECC t1.2	☒
15	O-RING	603 1-000004	2	314	φ 3.0, t1.2	☒
16	POLYWASHER(II)	603 1-000006	1	315	φ 3.0xt0.5	☒
17	POLYWASHER(I)	603 1-000005	2	316	φ i3.0 x φ 05.0	☒



## 8-4 Fuser Parts List

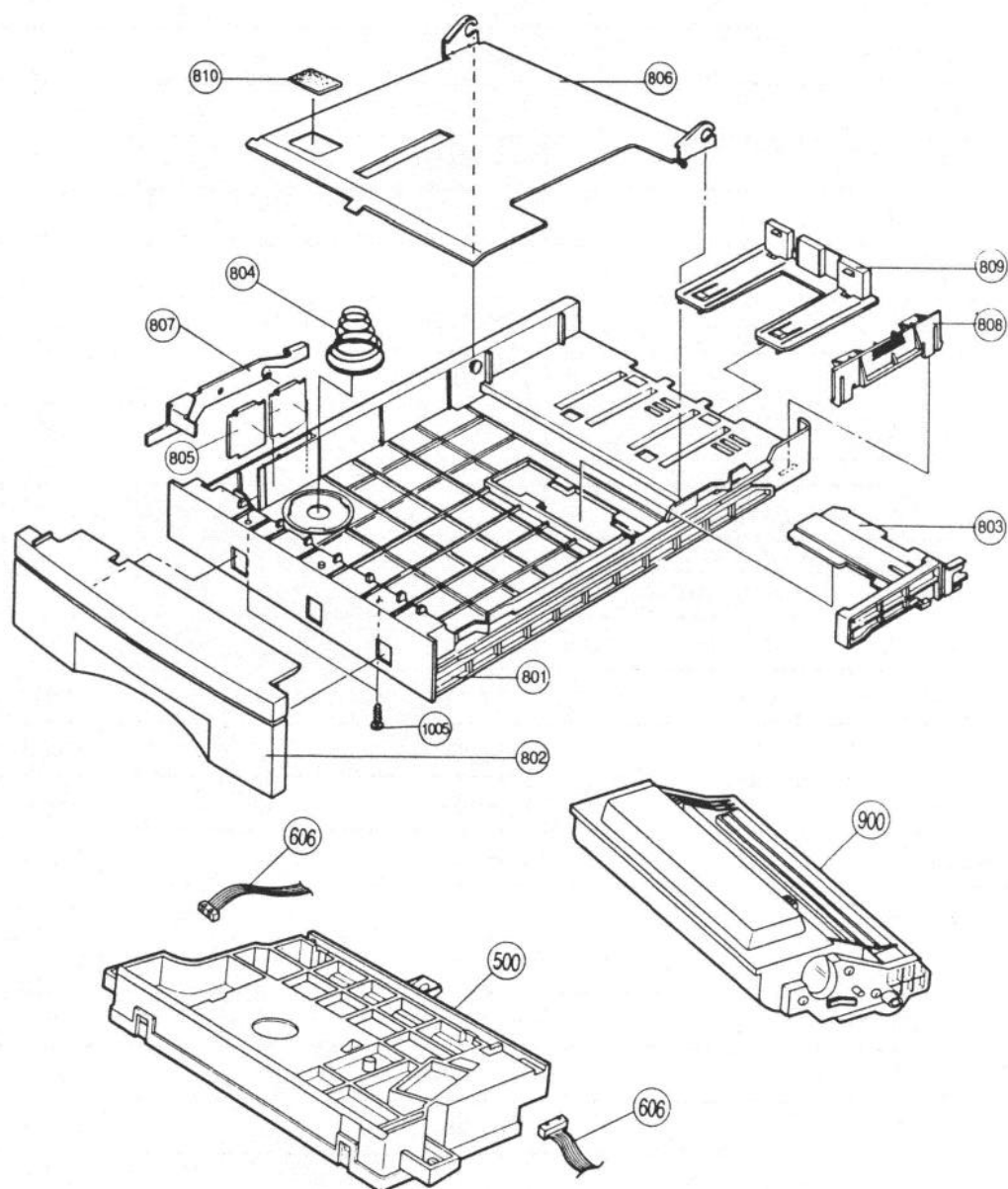
No.	Parts Name	Code No.	Qty	Drw No.	Material	A/S
1	ASSY-FUSER, 110V	JC93-30001A	1	—	—	☒
2	ASSY-FUSER, 220V	JC93-30001B	1	—		☒
3	FRAME-UPPER,FU	821 492022AA	1	201	PBT GF30% BLK	☒
4	SPRING EXIT F/UP	813 492024AA	2	202	SUS304 CSP-1/2H to.15	☐
5	ROLLER EXIT F/UP	821 492090AA	2	203	POM M90-02, BLK	☒
6	ELECTRODE-FU, L	815 492001AA	1	204	C52 1P t0.5	☐
7	THERMOSTAT	4712-000001	1	205	PW-2N, 160°C	☒
8	CBF-HARNESS, LAMP	JC39-40007A	1	206	3P, 475/275MM, WHT	☐
9	GEAR-EXIT/L, ID	82 149203 1AA	2	207	DURACON M90	☐
10	GEARFUSER	821 492023AA	1	208	NY66, GF33%	☒
11	H/R BEARING, L	821 492051AA	1	209	PPS RBA3 13	☒
12	H/R BEARING, R	821 492088AA	1	210	PPS RBA3 13	☒
13	H/ROLLER	815 492088AA	1	211	AL+PTFE, TEFLON	☒
14	LAMP-HALOGEN	4713-000001	1	212	115V, 600W	☒
15	LAMP-HALOGEN	47 13-000002	1	212	220V, 600W	☒
16	ELECTRODE-F&R	8 15 492002AA	1	213	C52 10P t0.8	☒
17	FRAME-LOWER, FU	821 492021AA	1	214	PBT GF30% BLK	☒
18	P/R BEARING	821 492044AA	2	215	PPS RBA3 13	☒
19	SPRING P/R	831 522060AA	2	216	SUS304 WPB Φ 0.9	☒
20	P/ROLLER	811 492011AA	1	217	SUM22+HTV+불소COATING	☐
21	GROUND-PLATE, FU	813 492014AA	1	218	SUS CSP 1/2H t0.2	☐
22	SPRING-THERMISTOR	813 492026AA	1	219	SUS CSP 1.2H t0.2	c l
23	EXIT ROLLER L	1404-000001	1	220	170°C	☒
24	BEARING EXIT FU, R	811 492010AA	1	221	SUM24L+CR	☒
25	BEARING EXIT FU, L	821 492006AA	1	222	POM (CE-20) BLK	☒
26	GEAR-EXIT, FU	821 492005AA	1	223	POM BLK	☒
27	ACTUATOREXIT	821 492030AA	1	224	PEBAX	☒
28	GUIDE-CLAW	821 492001AA	1	225	POM BLK	☒
29	SPRING-CLAW	JC6120005A	4	226	LCL-4024(PEEK+PTFE+CF)	☐
30		6107-00008	4	227	SUS304 WPB	☒





# 8-5 Assy Pick-up Parts List

No.	Parts Name	Code No.	Qty	Drw No.	Material	A/S
1	ASSY PICK-UP	JC93-40001A	1	—	—	☒
2	GEAR-PICK UP	82 149204 1AA	1	401	LNP LUBLILOY R	☒
3	SHAFT-PICK, UP	8 13 492030AA	1	402	SUM24L, N1	☐
4	BEARING-PICK-UP	821 492007AA	4	403	POM (CE-20) BLK	☒
5	GEAR-PICK, DOWN	821 492008AA	1	404	SUS304 WPB, Φ 0.5	☒
6	SPRING-P/P	831 522031DA	1	405	SUS304 WPB, Φ 0.5	☒
7	GND-FEED	813 492010AA	1	406	SUS304 CSP 1/2H, t0.15	☐
8	FRAME-FEED	821 492020AA	1	407	PC GF30% BLK	☒
9	HOUSING-PICK, UP	821 492062AA	1	408	ABS HB BLK	☒
10	RUBBER-PICK, UP	821 492082AA	1	409	EPDM 30"	☒
11	ROLLER-FEED, DRIVE	821 492071AA	1	410	POM BLK+URETHAN	☐
12	GEAR-FEED	821 492033AA	1	411	DURACON M90	☒
13	GEAR-P/UP, DRIVE	821 492040AA	1	412	DURACON M90	☒
14	SHAFT-FEED	813 492028AA	1	413	SUN 24N NI	☒
15	SPRING-FEED, SMALL	831 521073BA	1	414	SUS304 WPB, Φ 0.6	☒
16	HOLDER-FEED, SMALL	831 521073BA	1	415	ABS GF20% BLK	☒
17	SUB HOLDER-FEED, SMALL	821 492077AA	1	416	PON NTR	☒
18	ROLLER-FEED, SMALL	821 492073AA	1	417	POM NTR	☒
19	ROLLER-FEED, LARGE	821 492072AA	2	418	POM BLK	☒
20	SHAFT-FEED, IDLE	813 492029AA	3	419	SUM 24L Ni	☒
21	HOLDER-FEED, LARGE	821 492055AA	1	420	ABS GF20% BLK	☐
22	SPRING-FEED, LARGE	831 522060EA	1	421	SUS304 WPB, Φ 0.8	☒



## 8-6 Cassette & LSU & Developer Ass'y

No.	Description	Code No.	Q'ty	Drw No.	A/S
1	MEA-FEEDERCAS,250SHEET:ML-85,ML-85 PLUS,QL-85	JC97-01073A	1	-	■
2	PMO-FRAME CASSETTE	JC72-40347B	1	801	■
3	PMO-GUIDE SUB CST	JC72-40301A	1	802	■
4	PMO-GUIDE SIDE CST	JC72-40304A	1	803	■
5	SPRING-KNOCK UP	JC61-70007A	1	804	■
6	IPR-GUIDE PAPER	JC70-10219A	2	805	■
7	IPR-PLATE KNOCK UP	JC70-10016A	1	806	■
8	IPR-FINGER	JC70-10213A	1	807	■
9	PMO-GUIDE REAR CST	JC72-40302A	1	808	■
10	PMO-GUIDE EXTENSION	JC72-40305A	1	809	■
11	MMP,PAD:CORK T1.0	JC73-10911A	1	810	■

No.	Description	Code No.	Q'ty	Drw No.	A/S
1	ELA-FEEDERCAS,150SHEET:ML-84/85G,QL-84/85G, ML-84/85G PLUS	JC97-01072A	1	-	■
2	PMO-FRAME CASSETTE	JC72-40331A	1	801	■
3	PMO-GUIDE SUB CST	JC72-30204A	1	802	■
4	PMO-GUIDE SIDE CST	JC72-40345A	1	803	■
5	SPRING-KNOCK UP	6107-000120	1	804	■
6	IPR-GUIDE PAPER	JC70-10219A	2	805	■
7	IPR-PLATE KNOCK UP	JC70-10222A	1	806	■
8	IPR-FINGER	JC70-10213A	1	807	■
9	PMO-GUIDE REAR CST	JC72-40344A	1	808	■
10	PMO-GUIDE EXTENSION	JC72-40346A	1	809	■
11	MMP,PAD:CORK T1.0	JC73-10911A	1	810	■

No.	Description	Code No.	Q'ty	Drw No.	A/S
1	UNIT-LSU:ML-80,11244RPM	JC59-10501A	1	500	□
No.	Description	Code No.	Q'ty	Drw No.	A/S
1	OLD CARTRIDGE : NO CLN&OPC	ML-C800(E)	1	900	□
2	NEW CARTRIDGE: CLN&OPC	ML-C810(E)	1	900	■

# 8-7 Engine Board

8-7 – 1 PCB Revision 4.8 & 5.1 Comparison

Ver .	Code No.	Description/Specification	Unit	Q'ty	Locat i on No.
<b>V4.8</b> <b>v5.1</b>	JC41-10012A JC41-10012B	<b>PCB-ML, ENGINE(X): ML-80(X)</b> PCB-ML, ENGINE:ML-80+	<b>EA</b>	1	<b>PCB V4.8</b> <b>PCB V5.1</b>
<b>V4.8</b> <b>v5.1</b>	<b>2001-000812</b> JC39-40511A	R-CARBON:5.6Kohm,5%,1/8W <b>CBF- HARNESS: ML- 80, JUMPER</b>	<b>EA</b>	1	<b>R267</b>
V4.8 V5.1	<b>0401-000005</b> <b>0401-000005</b>	DIODE-SWITCHING:1N4148 DIODE-SWITCHING:1N4148	<b>EA</b>	1	JP121-U201#5 D218
V4.8 V5.1	<b>2001-000660</b> <b>2001-000660</b>	R-CARBON:33Kohm,5%,1/8W R-CARBON:33Kohm,5%,1/8W	<b>EA</b>	1	<b>JP102</b> <b>R276</b>
V4.8 <b>v5.1</b>	<b>2001-001145</b> <b>2009-001042</b>	R-CARBON(S):4.7Mohm,5%,1/2W <b>R-METAL GLAZE:4.7Mohm,1%,1/4W,AA,TP,3x9</b>	<b>EA</b>	2	R204,207
<b>V4.8</b> V5.1	<b>2001-001252</b> <b>2009-001041</b>	R-CARBON(S):2Mohm,5%,1/2W <b>R-METAL GLAZE:2Mohm,1%,1/4W,AA,TP</b>	<b>EA</b>	7	R201,202,203,205,206,208,209
V4.8 V5.1	<b>2201-000326</b> <b>2202-000186</b>	C-CERAMIC,DISC:2.2nF,10% C-CERAMIC,MLC-AXIAL:2.2nF,5%,50V,NPO,	<b>EA</b>	2	C2,3
V4.8 V5.1	<b>3405-000167</b> <b>0604-000229</b>	SWITCH-MICRO:5V,1mA,2.1gf <b>PHOTO- INTERRUPTER: TR, -, -, -, BK</b>	<b>EA</b>	1	<b>SW1</b> <b>OP3</b>
V4.8 V5.1	<b>2009-001026</b> <b>2009-001041</b>	<b>R-METAL GLAZE:4.7Mohm,1%,1/4W,AA,TP,3x9</b> <b>R-METAL GLAZE:4.7Mohm,1%,1/4W,AA,TP,3x9</b>	<b>EA</b>	1	<b>THV OUT</b> <b>R277</b>
V4.8 V5.1	<b>2004-002001</b> <b>2004-002001</b>	R-METAL:12.1Kohm,1%,1/8W R-METAL:12.1Kohm,1%,1/8W	<b>EA</b>	1	Q5(C)-JP92(SOLDER <b>SIDE</b> ) <b>R63</b>
V4.8 V5.1	<b>2201-000021</b> <b>2201-000021</b>	C-CERAMIC,DISC:100nF C-CERAMIC,DISC:100nF	<b>EA</b>	1	JP60-BD1(CN3#5) <b>C46</b>
<b>V4.8</b> V5.1	JC39-40514A JC39-40513A	CBF-HARNESS:ML-80,FLAT,UL1007,145mm <b>CBF HARNESS:ML-80,FLAT,6.9,220mm,WHT</b>	<b>EA</b>	1	CLN(SOLDER <b>SIDE</b> ) <b>CN7</b>
V4.8 <b>v5.1</b>	JC39-40516A JC39-40518A	CBF-HARNESS:ML-80,WIRE,UL1007,300mm, <b>CBF HARNESS:ML-80,FLAT,UL1007,220X3mm,</b>	<b>EA</b>	1	OPC(SOLDER <b>SIDE</b> ) CN8
V5.1	<b>3711-002653</b> <b>3711-000901</b>	CONNECTOR-HEADER:BOX,3P,1R CONNECTOR-HEADER:BOX,3P,1R	<b>EA</b>	1	<b>CN7</b> CN8
V5.1	<b>0402-000129</b>	DIODE-RECTIFIER:1N4003,200V,1A,D0-41	<b>EA</b>	1	D217
V5.1	<b>2004-000337</b>	R-METAL:150ohm,5%,1/8W	<b>EA</b>	1	<b>R64</b>

## 8-7-2 220Vac(PCB REV 5.1)

Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
TOP	JC96-01004A	ELA-PCU:ML-80,EXPORT,NO SCF,CLN&OPC	EA	1	M-85G for new cartridge
	JC96-01003A	ELA-PCU:ML-80,EXPORT,SCF,CLN&OPC			M-85 for new cartridge
	JC96-01043A	ELA-PCU:ML-80,EXPORT,NO SCF+CLN&OPC			M-85G for old cartridge
	JC96-01041A	ELA-PCU:ML-80,EXPORT,SCF,NO CLN&OPC			M-85 for old cartridge
SUB	JC94-00920A	PRA-PCU AUTO:ML-80,EXPORT	EA	1	EXPORT(220-240v)
	JC39-40511A	CBF-HARNESS: M- 80, JUMPER	EA	167	JP~,R267
	JC41-10012B	PCB-ML,ENGINE(X):ML-80(X)	EA	1	PCB V5.1
	0401-000005	DIODE-SWITCHING:1N4148	EA	13	D2-8,101,154,209,212,213,215,218
	0402-000012	DIODE-RECTIFIER:UF4007	EA	1	D102
	0402-000129	DIODE-RECTIFIER:1N4003,200V,1A,D0-41	EA	4	D1,211,216,217
	0402-000145	DIODE-RECTIFIER:1N4937	EA	1	D103
	0403-000005	DIODE-ZENER:UZ5.1B,5.1V	EA	1	ZD102
	0403-000338	DIODE-ZENER:UZ27BM,27V	EA	1	ZD103
	0403-000346	DIODE-ZENER:UZ33B,33V	EA	3	ZD152,204,205
	0403-000356	DIODE-ZENER:UZ5.6BCB,5.6V	EA	2	ZD151,201
	0403-000475	DIODE-ZENER:1N5274B,130V	EA	2	ZD101,203
	0403-000554	DIODE-ZENER:UZ7.5BM,7.5V	EA	1	ZD202
	0501-000010	TR-SMALL SIGNAL:KSC1008,NPN	EA	12	Q1-8,10,206,210,211
	0501-000294	TR-SMALL SIGNAL:KSA708,PNP	EA	4	Q205,207,208,209
	2001-000002	R-CARBON:200Kohm,5%,1/8W	EA	1	R107
	2001-000003	R-CARBON:330ohm,5%,1/8W	EA	4	R25,52,111,151
	2001-000005	R-CARBON:390ohm,5%,1/8W	EA	3	R218,221,231
	2001-000006	R-CARBON:2.4Kohm,5%,1/8W	EA	2	R2,3
	2001-000012	R-CARBON:680Kohm,5%,1/8W	EA	1	R236
	2001-000015	R-CARBON(S):0.5ohm,5%,1/2W	EA	2	R8,R62
	2001-000019	R-CARBON(S):10ohm,5%,1/2W	EA	2	R217,230
	2001-000023	R-CARBON:47ohm,5%,1/4W	EA	1	R109
	2001-000027	R-CARBON:100ohm,5%,1/4W	EA	1	R104
	2001-000044	R-CARBON:1.2Kohm,5%,1/4W	EA	1	R251
	2001-000045	R-CARBON:1.8Kohm,5%,1/4W	EA	1	R274
	2001-000105	R-CARBON:1.5Kohm,5%,1/4W	EA	1	R14

Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
	2001-000118	R-CARBON(S) :180ohm,5%,1/2W	EA	1	R103
	2001-000221	R-CARBON:1.2Kohm,5%,1/8W	EA	1	R39
	2001-000273	R-CARBON:100Kohm,5%,1/8W	EA	2	R215,238
	2001-000281	R-CARBON:100ohm,5%,1/8W	EA	7	R15,24,29,30,31,155,252
	2001-000331	R-CARBON:12Kohm,5%,1/8W	EA	1	R56
	2001-000429	R-CARBON:1Kohm,5%,1/8W	EA	11	R12.18.33.34.41.42.44.45.46. 49,58
	2001-000449	R-CARBON:2.2Kohm,5%,1/8W	EA	6	R225,250,254,255,256,259
	2001-000515	R-CARBON:220ohm,5%,1/8W	EA	1	R27
	2001-000522	R-CARBON:22Kohm,5%,1/8W	EA	1	R268
	2001-000552	R-CARBON:270ohm,5%,1/8W	EA	1	R112
	2001-000563	R-CARBON:27Kohm,5%,1/8W	EA	1	R253
	2001-000591	R-CARBON:3.3Kohm,5%,1/8W	EA	1	R57
	2001-000660	R-CARBON:33Kohm,5%,1/8W	EA	7	R249,257,263~266,276
	2001-000734	R-CARBON:4.7Kohm,5%,1/8W	EA	3	R47,51,110
	2001-000780	R-CARBON:470ohm,5%,1/8W	EA	1	R156
	2001-000786	R-CARBON:47Kohm,5%,1/8W	EA	7	R9,10,54,223,224,227,232
	2001-000812	R-CARBON:5.6Kohm,5%,1/8W	EA	17	R7,11,13,18,20,20,20,20,20, 40,43,59,60,61,63,260,261
	2001-000816	R-CARBON:5.6ohm,5%,1/4W	EA	1	R113
	2001-000832	R-CARBON:510ohm,5%,1/8W	EA	2	R4,20
	2001-000864	R-CARBON:56Kohm,5%,1/8W	EA	2	R53,248
	2001-001015	R-CARBON:9.1Kohm,5%,1/8W	EA	1	R262
	2001-001070	R-CARBON(S) :2.2Kohm,5%,1/2W	EA	1	R102
	2001-001093	R-CARBON(S) :3.3Mohm,5%,1/2W	EA	1	R48
	2001-001119	R-CARBON(S) :3.3Mohm,5%,1/2W	EA	5	R210,212,226,229,239
	2001-001150	R-CARBON(S) :470ohm,5%,1/2W	EA	2	R101,105
	2001-001165	R-CARBON(S) :560ohm,5%,1/2W	EA	2	R216,219
	2004-000002	R-METAL :78.7Kohm,1%,1/8W	EA	1	R247
	2004-000003	R-METAL :16.2Kohm,1%,1/8W	EA	1	R237
	2004-000337	R-METAL :150ohm,5%,1/8W	EA	3	R16,23,64

Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
	2004-000345	R-METAL:15Kohm,1%,1/8W	EA	5	R17,22,55,222,267
	2004-000385	R-METAL:17.4Kohm,1%,1/8W	EA	1	R246
	2004-000433	R-METAL:1Kohm,1%,1/8W	EA	1	R213
	2004-000517	R-METAL:200Kohm,1%,1/8W	EA	1	R258
	2004-000544	R-METAL:21.5Kohm,1%,1/8W	EA	1	R241
	2004-000683	R-METAL:2Kohm,1%,1/8W	EA	1	R152
	2004-000691	R-METAL:3.16Kohm,1%,1/8W	EA	1	R153
	2004-000754	R-METAL:309Kohm,1%,1/8W	EA	1	R228
	2004-000869	R-METAL:3Kohm,1%,1/8W	EA	1	R154
	2004-000885	R-METAL:4.3Kohm,5%,1/8W	EA	1	R37
	2004-000965	R-METAL:470Kohm,1%,1/8W	EA	1	R243
	2004-001156	R-METAL:619Kohm,1%,1/8W	EA	1	R242
	2004-001231	R-METAL:75Kohm,1%,1/8W	EA	3	R235,244,269
	2004-001315	R-METAL:86.6Kohm,1%,1/8W	EA	2	R234,240
	2004-001357	R-METAL:93.1Kohm,1%,1/8W	EA	1	R233
	2004-001364	R-METAL:97.6ohm,1%,1/8W	EA	1	R1
	2004-002001	R-METAL:12.1Kohm,1%,1/8W	EA	2	R63,245
	2009-001041	R-METAL GLAZE:2Mohm,1%,1/4W,AA,TP,3X9	EA	7	R201-203,205,206,208,209
	2009-001042	R-METAL GLAZE:4.7Mohm,1%,1/4W,AA,TP,	EA	3	R204,207,277
	2201-000003	C-CERAMIC,DISC:68pF,10%	EA	1	C205
	2201-000004	C-CERAMIC,DISC:100pF,10%	EA	3	C203,213,220
	2201-000013	C-CERAMIC,DISC:470pF,10%	EA	2	C4,7
	<b>2201-000017</b>	C-CERAMIC,DISC:1nF,10%	<b>EA</b>	<b>14</b>	C16,17,19,22,23,27,29,38,39  40,41,42,43,45
	<b>2201-000019</b>	C-CERAMIC,DISC:10nF	<b>EA</b>	<b>2</b>	C106,232
	<b>2201-000021</b>	C-CERAMIC,DISC:100nF	<b>EA</b>	<b>10</b>	C26,32,34,37,46,209,222,226  <b>227,229</b>
	<b>2201-000138</b>	C-CERAMIC,DISC:100pF	<b>EA</b>	<b>3</b>	C28,30,31
	<b>2201-000163</b>	C-CERAMIC,DISC:10nF	<b>EA</b>	<b>11</b>	C1,8,9,13,14,15,18,24,36  <b>217,231</b>
	<b>2201-000326</b>	C-CERAMIC,DISC:2.2nF,10%	<b>EA</b>	<b>3</b>	C218,223,230



Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
	2201-000391	C-CERAMIC,DISC:22pF,5%	EA	2	C20,21
	2201-000469	C-CERAMIC,DISC:330pF,10%	EA	2	C25,44
	2201-000473	C-CERAMIC,DISC:33nF,	EA	5	C207,208,210,224,214
	2201-000643	C-CERAMIC,DISC:680pF,10%	EA	1	C111
	2201-000724	C-CERAMIC,DISC:470pF	EA	9	C201,202,204,206,211,212] 215,216,219]
	2202-000002	C-CERAMIC,MLC-AXIAL:10nF,5%	EA	2	C10,12
	2202-000186	C-CERAMIC,MLC-AXIAL:2.2nF,5%,50V,NPO	EA	2	C2,3
	2202-000317	C-CERAMIC,MLC-RADIAL:100nF	EA	1	C110
	2202-000413	C-CERAMIC,MLC-RADIAL:2.2nF	EA	1	C225
	2202-000010	C-FILM,PEF:100nF,5%,100V	EA	1	C112
	2301-000013	C-FILM,PEF:4.7nF,5%,100V	EA	3	C113,221,233
	2401-000027	C-AL:4.7uF,20%,50V,GP,TP	EA	2	C33,35
	2401-000613	C-AL:1uF,20%,50V,WT	EA	2	C109,152
	2401-001476	C-AL:47uF,20%,10V,GP,TP	EA	2	C6,11
	2401-001576	C-AL:47uF,20%,50V,GP,TP	EA	2	C5,228]
	2401-001585	C-AL:47uF,20%,50V,WT]	EA	1	C114]
	24048-035-020	FERRITE-BEAD: BLOIRNI-A62T	EA	7	BD1,2,101,102,103,151,152]
	3301-000344	CORE-FERRITE BEAD: ZZ,	EA	3	FB1,2,3]
	3602-000001	FUSE-CLIP:30mohm	EA	4	FH101,152]
	893 390057AA	DIODE-REC,ESJA57-04,D0-35]	EA	9	D201-208,210]
SUB	JC94-00923A]	PRA-PCU MAN/ROB:ML-80,EXPORT]	EA	1	EXPORT 220V
	JC26-20100A]	TRANS-AF:ML-80,1.3uH	EA	1	T203
	JC26-20301B]	TRANS-AF:ML-80,95mH	EA	3	T201,202,204]
	JC26-20301D]	TARNS-AF:ML-80,0.32WIRE]	EA	1	T101
	JC27-60100A]	COIL-FILTER:110mohm	EA	1	L101
	JC27-60101A]	COIL-FILTER:300uH	EA	1	L103]
	JC27-60101B]	COIL-FILTER:9uH	EA	1	L152
	JC27-60101Q]	COIL-FILTER:6uH	EA	1	L151
	JC27-60101D]	COIL-FILTER:	EA	1	L102]
	JC70-10909A]	IPR-CONNECTOR HV: ML- 80	EA	3	MHV,DEV,SUPPLY]



Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
	0402-000104	DIODE-BRIDGE:D3SBA60,600V	EA	1	DB101
	0502-000245	TR-POWER:KSB1151-Y,PNP	EA	1	Q9
	0604-000142	PHOTO-COUPLER:TR,200mW	EA	2	PC152,153
	0604-000146	PHOTO-COUPLER:TRIAC,	EA	1	PC151
	0604-000180	PHOTO-COUPLER:TR,	EA	2	OP1,2
	0604-000229	PHOTO-INTERRUPTER:TR,	EA	1	OP3
	0801-000528	IC-CMOS LOGIC:74HCT574	EA	1	U4
	0803-001100	IC-TTL:7407,BUFFER/DRIVER	EA	1	U203
	0903-000219	IC-MICROCOMPUTER:88C4316	EA	1	U3
	1201-000229	IC-OP AMP:324,DIP,14P	EA	1	U201
	1202-000103	IC-VOLTAGE COMP.:393,DIP	EA	1	U5
	1203-000002	IC-POS1.ADJUST REG.:431	EA	1	U151
	1203-000258	IC-POS1, FIXED REG.:7818	EA	1	U202
	1404-000167	THERMISTOR-NTC:5ohm,10%	EA	1	TH101
	1405-000147	VARISTER:470V,4500A	EA	1	TNR101
	2003-000547	R-METAL OXIDE(S):1ohm,5%,3W	EA	2	R5,6
	2003-000706	R-METAL OXIDE(S):47Kohm,5%,2W	EA	1	R108
	2005-000168	R-WIRE WOUND,NON:0.22ohm,5%,2W	EA	1	R114
	2006-000125	R-CEMENT:260ohm,5%,5W,CB	EA	1	R157
	2009-000001	R-GRAZE:30Mohm,5%,1/2W	EA	2	R211,214
	2009-000002	R-GRAZE:200Mohm,5%,1/2W	EA	1	R220
	2103-000001	VR-SEMI:10Kohm,30%,1/5W,TOP	EA	1	VR201
	2103-000156	VR-SEMI:10Kohm,10%,1/2W,TOP	EA	1	VR202
	2201-000023	C-CERAMIC,DISC:2.2nF,20%	EA	3	C103,104,115
	2201-000154	C-CERAMIC,DISC:10nF	EA	1	C108
	2306-000114	C-FILM,MPPF:100nF,20%,250V	EA	1	C102
	2401-000183	C-AL:1000uF,20%,35V,WT	EA	2	C156,157
	2401-000697	C-AL:2200uF,205,16V,WT	EA	1	C151
	2401-001691	C-AL:157uF,20%,400V	EA	1	C107
	2401-001700	C-AL:477uF,20%,10V	EA	3	C153,154,155
	2501-000203	C-PAPER:470nF,0.2,250VAC	EA	1	C101

Lev	Code No.	Description/Specification	Unit	Qty	Location No.
	<b>2801-000002</b>	CRYSTAL-UNIT:6.94407MHz	EA	1	X1
	3405-000125	SWITCH-MICRO:125V,5A,50gf	EA	2	SW151,152
	3601-000003	FUSE-:250V,5A,FSF,GLASS	EA	1	F151
	3601-000296	FUSE-FERRULE:250V,5A,TIME	EA	1	F101
	3704-000235	SOCKET-IC:28P,DIP,SN,2.54	EA	1	U2
	3711-000217	CONNECTOR-HEADER:1WALL,3P	EA	1	CN101
	3711-000901	CONNECTOR-HEADER:BOX,3P,1R	EA	1	CN8
	3711-002104	CONNECTOR-HEADER:1WALL,2P	EA	1	CN102
	3711-002653	CONNECTOR-HEADER:BOX,3P	EA	1	CN7
	3711-003203	CONNECTOR-HEADER:3WALL.6P	EA	1	CN1
	3711-003204	CONNECTOR-HEADER:BOX,24P	EA	1	CN5
	3711-003205	CONNECTOR-HEADER:BOX,4P	EA	1	CN2
	3711-003206	CONNECTOR-HEADER:BOX,8P	EA	1	CN6
	3711-003207	CONNECTOR-HEADER:BOX,13P	EA	1	CN3
	<b>3712-000001</b>	<b>CONNECTOR-TERMINAL: PLATE</b>	EA	1	THM
	6002-000154	SCREW-TAPPING:PH,+,2,M3,L	EA	1	Q203
	881 907029SA	IC-LIN,7029,MOTOR DRIVER:	EA	1	U1
	881 907552AA	IC-LIN,7552,PWM CONTROL:	EA	1	U101
	891 490526AB	TR-NPN,KSD526Y,T0-220:30W	EA	2	Q202,204
	935 240902DW	CON-WALL HEADER,2P,2.5MM:	EA	1	CN4
	937 330009AA	MAG-SOLENOID,24V:	EA	1	CLUTCH
<b>SUB</b>	JC96-00319A	<b>ELA-H/SINK:ML-80</b>	EA	1	<b>220V ALL</b>
	JC61-70100A	SPRING-PS:ML-66G,STS304-M	EA	1	<b>FOR SMPS H/SINK</b>
	JC62-20001A	TUBE-IRF840:SSP5N90,N,900	EA	1	Q102
	<b>0402-000304</b>	DIODE-RECTIFIER:STPR1020CF	EA	1	<b>D153</b>
	0402-000314	DIODE-RECTIFIER:D10SC4M,40V	EA	1	<b>D152</b>
	<b>0505-000173</b>	FET-SILICON:SSP5N90,N,900	EA	1	Q102
	1401-000108	THYRISTOR-TRIAC:100A,600V	EA	1	Q101
	6002-000154	SCREW-TAPPING:PH,+,2,M3,L	EA	1	Q203
	6003-000008	SCREW-TAPPING:BH,+,S,M3,L	EA	1	Q201
	6003-000119	SCREW-TAPPING:BH,+,B,M3,L	EA	1	D152

Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
	6003-000269	SCREW-TAPPING: BH, +, S, M3, L	EA	2	Q101, D153
	831 511011BA	COM, HEAT-SINK TRANS: AL 60	EA	1	Q102, D152, 153
	831 515034AA	COM, HEAT-SINK HVPS: SPCC t	EA	2	Q101, 201
	831 516035AA	COM, HEAT-SINK SMPS: AL t2.	EA	1	Q203
	891 490526AB	TR-NPN, KSD526Y, TO-220: 30W	EA	2	Q201, 203
SUB	JC96-01035A	ELA-PCU SHIELD: ML-80 NO SCF+SWITCH	EA	1	
	JC96-01034A	ELA-PCU SHIELD: ML-80, SCF, NO SWITCH			
	JC39-40020A	CBF-HARNESS: UL1061, 320MM, 8P	EA	1	CN6 (for ML-85's SCF)
	JC39-40022A	CBF-HARNESS: UL/CSA, 85MM, PULL, #22	EA	1	INLET
	JC39-40513A	CBF-HARNESS: ML-80, 220MM	EA	1	CN7
	JC39-40518A	CBF-HARNESS: ML-80, 220MM	EA	1	CN8
	JC70-10226A	IPR-SHIELD PCU: ML-80 SECC	EA	1	
	JC72-10201A	PPR-INSULATOR PCU: ML-80	EA	1	
	JF68-30527H	LABEL(R)-BAR CODE: SF1000	EA	1	
	JF68-30527J	LABEL(R)-BAR CODE: SF1000	EA	0.06	
	0201-000001	ADHESIVE-HR: #410, BLACK	GR	0.0001	
	0201-000007	ADHESIVE-CYA: N02/TOKYO/3B	KG	0.1	
	0201-000008	ADHESIVE-HM: PP_#3748, WHT	KG	0.005	
	1102-000239	IC-EPROM: 27C256, 32Kx8BIT	EA	1	u2
	6003-000132	SCREW-TAPTITE: BH, +, S, M4, L	EA	5	PCB & SHIELD
	6031-000120	WASHER-E, T: M4, ID4.3, ODB.5	EA	1	F.G.(OF INLET HANESS)

8-7-3 110Vac(PCB REV 5.1)

Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
TOP	JC96-01008A JC96-01007A JC96-01040A JC96-01040B	ELA-PCU:ML-80,EXPORT,NO SCF,CLN&OPC ELA-PCU:ML-80,EXPORT,SCF,CLN&OPC ELA-PCU:ML-80,EXPORT,NO SCF+CLN&OPC ELA-PCU:ML-80,EXPORT,SCF,NO CLN&OPC	EA	1	QL-85G for new cartridge QL-85 for new cartridge QL-85G for old cartridge QL-85 for old cartridge
SUB	JC94-00921A	PRA-PCU AUTO:ML-80,EXPORT	EA	1	EXPORT(110-120V)
	JC39-40511A	CBF-HARNESS:ML-80, JUMPER	EA	167	JP~,R267
	JC41-10012B	PCB-ML,ENGINE(X):ML-80(X)	EA	1	PCB V5.1
	0401-000005	DIODE-SWITCHING:1N4148	EA	13	D2-8,101,154,209,212,213, 215,218
	0402-000012	DIODE-RECTIFIER:UF4007	EA	1	D102
	0402-000129	DIODE-RECTIFIER:1N4003,200V 1A DO-41	EA	4	D1,211,216,217
	0402-000145	DIODE-RECTIFIER:1N4937	EA	1	D103
	0403-000005	DIODE-ZENER:UZ5.1B,5.1V	EA	1	ZD102
	0403-000338	DIODE-ZENER:UZ27BM,27V	EA	1	ZDi03
	0403-000346	DIODE-ZENER:UZ33B,33V	EA	3	ZD152,204,205
	0403-000356	DIODE-ZENER:UZ5.6BCB,5.6V	EA	2	ZD151,201
	0403-000475	DIODE-ZENER:1N5274B,130V	EA	1	ZD203
	0403-000554	DIODE-ZENER:UZ7.5BM,7.5V	EA	1	ZD202
	0501-000010	TR-SMALL SIGNAL:KSC1008,NPN	EA	12	Q1-8,10,206,210,211
	0501-000294	TR-SMALL SIGNAL:KSA708,PNP	EA	4	Q205,207,208,209
	2001-000003	R-CARBON:330ohm,5%,1/8W	EA	4	R25,52,111,151
	2001-000005	R-CARBON:390ohm,5%,1/8W	EA	2	R221,231
	2001-000006	R-CARBON:2.4Kohm,5%,1/8W	EA	2	R2,3
	2001-000012	R-CARBON:680Kohm,5%,1/8W	EA	1	R236
	2001-000015	R-CARBON(S):0.5ohm,5%,1/2W	EA	2	R8,R62
	2001-000019	R-CARBON(S):10ohm,5%,1/2W	EA	2	R217,230
	2001-000023	R-CARBON:47ohm,5%,1/4W	EA	1	R109
	2001-000027	R-CARBON:100ohm,5%,1/4W	EA	1	R104
	2001-000044	R-CARBON:1.2Kohm,5%,1/4W	EA	1	R251
	2001-000045	R-CARBON:1.8Kohm,5%,1/4W	EA	1	R274
	2001-000085	R-CARBON(S):100Kohm,5%,1/2W	EA	2	R106,107
	2001-000105	R-CARBON:1.5Kohm,5%,1/4W	EA	1	R14

Lev	Code No.	Description/Specification	Unit	Q'ty	Location No. <b>1</b>
	2001-000118	R-CARBON(S) : 180ohm, 5%, 1/2W	EA	1	<b>R103</b>
	<b>2001-000221</b>	R-CARBON : 1.2Kohm, 5%, 1/8W	EA	1	<b>R39</b>
	<b>2001-000273</b>	R-CARBON : 100Kohm, 5%, 1/8W	EA	2	R215, 238
	<b>2001-000281</b>	R-CARBON : 100ohm, 5%, 1/8W	EA	7	R15, 24, 29, 30, 31, 155, 252
	<b>2001-000331</b>	R-CARBON : 12Kohm, 5%, 1/8W	EA	1	<b>R56</b>
	<b>2001-000429</b>	R-CARBON : 1Kohm, 5%, 1/8W	EA	10	R12, 18, 33, 34, 41, 42, 44, 45, 46, 49
	<b>2001-000449</b>	R-CARBON : 2.2Kohm, 5%, 1/8W	EA	6	R225, 250, 254, 255, 256, 259
	<b>2001-000515</b>	R-CARBON : 220ohm, 5%, 1/8W	EA	1	<b>R27</b>
	<b>2001-000522</b>	R-CARBON : 22Kohm, 5%, 1/8W	EA	1	<b>R268</b>
	<b>2001-000552</b>	R-CARBON : 270ohm, 5%, 1/8W	EA	1	<b>R112</b>
	<b>2001-000563</b>	R-CARBON : 27Kohm, 5%, 1/8W	EA	1	<b>R253</b>
	<b>2001-000591</b>	R-CARBON : 3.3Kohm, 5%, 1/8W	EA	1	R57
	<b>2001-000660</b>	R-CARBON : 33Kohm, 5%, 1/8W	EA	7	R249, 257, 263~266, 276
	<b>2001-000734</b>	R-CARBON : 4.7Kohm, 5%, 1/8W	EA	2	R51, 110
	2001-000780	R-CARBON : 470ohm, 5%, 1/8W	EA	1	<b>R156</b>
	<b>2001-000786</b>	R-CARBON : 47Kohm, 5%, 1/8W	EA	7	R9, 10, 54, 223, 224, 227, 232
	<b>2001-000812</b>	R-CARBON : 5.6Kohm, 5%, 1/8W	EA	16	R7, 11, 13, 19, 26, 28, 36, 38, 40, 43, 59, 60, 61, 63, 260, 261
	2001-000816	R-CARBON : 5.6ohm, 5%, 1/4W	EA	1	R113
	2001-000832	R-CARBON : 510ohm, 5%, 1/8W	EA	2	R4, 20
	2001-000864	R-CARBON : 56Kohm, 5%, 1/8W	EA	2	R53, 248
	2001-001015	R-CARBON : 9.1Kohm, 5%, 1/8W	EA	1	R262
	2001-001070	R-CARBON(S) : 2.2Kohm, 5%, 1/2W	EA	1	R102
	2001-001093	R-CARBON(S) : 3.3Mohm, 5%, 1/2W	EA	1	R48
	2001-001119	R-CARBON(S) : 3.3Mohm, 5%, 1/2W	EA	5	R210, 212, 226, 229, 239
	2001-001150	R-CARBON(S) : 470ohm, 5%, 1/2W	EA	2	R101, 105
	2001-001165	R-CARBON(S) : 560ohm, 5%, 1/2W	EA	2	R216, 219
	<b>2001-003115</b>	R-METAL : 430ohm, 5%, 1/6W	EA <b>1</b>		<b>R218</b>
	<b>2004-000002</b>	R-METAL : 78.7Kohm, 1%, 1/8W	EA <b>1</b>		<b>R247</b>
	<b>2004-000003</b>	R-METAL : 16.2Kohm, 1%, 1/8W	EA	1	<b>R237</b>
	<b>2004-000337</b>	R-METAL : 150ohm, 5%, 1/8W	EA <b>3</b>		R16, 23, 64 <b>1</b>

Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
	2004-000345	R-METAL : 15Kohm, 1%, 1/8W	EA	5	R17, 22, 55, 222, 267
	2004-000385	R-METAL : 17.4Kohm, 1%, 1/8W	EA	1	R246
	2004-000433	R-METAL : 1Kohm, 1%, 1/8W	EA	1	R213
	2004-000517	R-METAL : 200Kohm, 1%, 1/8W	EA	1	R258
	2004-000544	R-METAL : 21.5Kohm, 1%, 1/8W	EA	1	R241
	2004-000683	R-METAL : 2Kohm, 1%, 1/8W	EA	1	R152
	2004-000691	R-METAL : 3.16Kohm, 1%, 1/8W	EA	1	R153
	2004-000754	R-METAL : 309Kohm, 1%, 1/8W	EA	1	R228
	2004-000869	R-METAL : 3Kohm, 1%, 1/8W	EA	1	R154
	2004-000885	R-METAL : 4.3Kohm, 5%, 1/8W	EA	1	R37
	2004-000965	R-METAL : 470Kohm, 1%, 1/8W	EA	1	R243
	2004-001156	R-METAL : 619Kohm, 1%, 1/8W	EA	1	R242
	2004-001231	R-METAL : 75Kohm, 1%, 1/8W	EA	3	R235, 244, 269
	2004-001315	R-METAL : 86.6Kohm, 1%, 1/8W	EA	2	R234, 240
	2004-001357	R-METAL : 93.1Kohm, 1%, 1/8W	EA	1	R233
	2004-001364	R-METAL : 97.6ohm, 1%, 1/8W	EA	1	R1
	2004-002001	R-METAL : 12.1Kohm, 1%, 1/8W	EA	2	R63, 245
	2009-001041	R-METAL GLAZE : 2Mohm, 1%, 1/4W, AA, TP, 3X9	EA	7	R201~203, 205, 206, 208, 209
	2009-001042	R-METAL GLAZE : 4.7Mohm, 1%, 1/4W, AA, TP,	EA	3	R204, 207, 277
	2201-000003	C-CERAMIC, DISC : 68pF, 10%	EA	1	C205
	2201-000004	C-CERAMIC, DISC : 100pF, 10%	EA	3	C203, 213, 220
	2201-000013	C-CERAMIC, DISC : 470pF, 10%	EA	2	C4, 7
	2201-000017	C-CERAMIC, DISC : 1nF, 10%	EA	14	C16, 17, 19, 22, 23, 27, 29, 38, 39, 40, 41, 42, 43, 45
	2201-000019	C-CERAMIC, DISC : 10nF,	EA	2	C106, 232
	2201-000021	C-CERAMIC, DISC : 100nF	EA	10	C26, 32, 34, 37, 46, 209, 222, 226, 227, 229
	2201-000138	C-CERAMIC, DISC : 100pF	EA	3	C28, 30, 31
	2201-000163	C-CERAMIC, DISC : 10nF	FA	11	C1, 8, 9, 13, 14, 15, 18, 24, 36, 217, 231
	2201-000326	C-CERAMIC, DISC : 2.2nF, 10%	EA	3	C218, 223, 230

Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
	2201-000391	C-CERAMIC,DISC:22pF,5%	EA	2	C20,21
	2201-000469	C-CERAMIC,DISC:330pF,10%	EA	2	C25,44
	2201-000473	C-CERAMIC,DISC:33nF,	EA	5	C207,208,210,224,214
	2201-000643	C-CERAMIC,DISC:680pF,10%	EA	1	C111
	2201-000724	C-CERAMIC,DISC:470pF	EA	9	C201,202,204,206,211,212,215,216,219
	2202-000002	C-CERAMIC,MLC-AXIAL:10nF,5%	EA	2	C10,12
	2202-000186	C-CERAMIC,MLC-AXIAL:2.2nF,5%,50V,NPO	EA	2	C2,3
	2202-000317	C-CERAMIC,MLC-RADIAL:100nF	EA	1	C110
	2202-000413	C-CERAMIC,MLC-RADIAL:2.2nF	EA	1	C225
	2202-000010	C-FILM,PEF:100nF,5%,100V	EA	1	C112
	2301-000013	C-FILM,PEF:4.7nF,5%,100V	EA	3	C113,221,233
	2401-000027	C-AL:4.7uF,20%,50V,GP,TP	EA	2	C33,35
	2401-000613	C-AL:1uF,20%,50V,WT	EA	2	C109,152
	2401-001476	C-AL:47uF,20%,10V,GP,TP	EA	2	C6,11
	2401-001576	C-AL:47uF,20%,50V,GP,TP	EA	2	C5,228
	2401-001585	C-AL:47uF,20%,50V,WT	EA	1	C114
	24048-035-02C	<b>FERRITE-BEAD: BLOIRNI - A62T</b>	EA	7	BD1,2,101,102,103,151,152
	3301-000344	CORE-FERRITE BEAD:ZZ,	EA	3	FB1,2,3
	3602-000001	FUSE-CLIP:30mohm	EA	4	FH101,152
	893 390057AA	DIODE-REC,ESJA57-04,D0-35	EA	9	D201~208,210
SUB	JC94-00922A	PRA-PCU MAN/ROB:ML-80,EXPORT	EA	1	EXPORT 110V
	JC26-20100A	TRANS-AF:ML-80,1.3uH	EA	1	T203
	JC26-20301B	TRANS-AF:ML-80,95mH	EA	3	T201,202,204
	JC26-20301C	TRANS-AF:ML-80,0.4WIRE	EA	1	T101
	JC27-60100A	COIL-FILTER:110mohm	EA	1	L101
	JC27-60101A	COIL-FILTER:300uH	EA	1	L103
	JC27-60101B	COIL-FILTER:9uH	EA	1	L152
	JC27-60101C	COIL-FILTER:6uH	EA	1	L151
	JC27-60101D	COIL-FILTER:	EA	1	L102
	JC70-10909A	IPR-CONNECTOR HV:ML-80	EA	3	MHV,DEV,SUPPLY

Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
	0402-000104	DIODE-BRIDGE:D3SBA60,600V	EA	1	DB101
	0502-000245	TR-POWER:KSB1151-Y,PNP	EA	1	Q9
	0604-000001	PHOTO-COUPLER:TR,50/600%,200mW	EA	2	PC152,153
	0604-000146	PHOTO-COUPLER: TRIAC,	EA	1	PC151
	0604-000180	PHOTO-COUPLER:TR,	EA	2	OP1,2
	0604-000229	PHOTO-INTERRUPTER:TR,	EA	1	OP3
	0801-000528	IC-CMOS LOGIC:74HCT574	EA	1	U4
	0803-001100	IC-TTL:7407,BUFFER/DRIVER	EA	1	U203
	0903-000219	IC-MICROCOMPUTER:88C4316	EA	1	U3
	1201-000229	IC-OP AMP:324,DIP,14P	EA	1	U201
	1202-000103	IC-VOLTAGE COMP.:393,DIP	EA	1	U5
	1203-000002	IC-POS1.ADJUST REG.:431	EA	1	U151
	1203-000258	IC-POS1,FIXED REG.:7818	EA	1	U202
	1404-000167	THERMISTOR-NTC:5ohm,10%	EA	1	TH101
	1405-000147	VARISTER:470V,4500A	EA	1	TNR101
	2003-000547	R-METAL OXIDE(S):1ohm,5%,3W	EA	2	R5,6
	2003-000706	R-METAL OXIDE(S):47Kohm,5%,2W	EA	1	R108
	2005-000164	R-WIRE WOUND,NON:0.1ohm,5%,2W	EA	1	R114
	2006-000125	R-CEMENT:260ohm,5%,5W,CB	EA	1	R157
	2009-000001	R-GRAZE:30Mohm,5%,1/2W	EA	2	R211,214
	2009-000002	R-GRAZE:200Mohm,5%,1/2W	EA	1	R220
	2103-000001	VR-SEMI:10Kohm,30%,1/5W,TOP	EA	1	VR201
	2103-000156	VR-SEMI:10Kohm,10%,1/2W,TOP	EA	1	VR202
	2201-000023	C-CERAMIC,DISC:2.2nF,20%	EA	3	C103,104,115
	2201-000154	C-CERAMIC,DISC:10nF	EA	1	C108
	2301-000323	C-FILM,PEF:220nF,0.1,250V	EA	1	C101
	2305-000002	C-M,POLYESTER:47nF,20%,250V	EA	1	C102
	2401-000183	C-AL:1000uF,20%,35V,WT	EA	2	C156,157
	2401-000697	C-AL:2200uF,205,16V,WT	EA	1	C151
	2401-001695	C-AL:22UF,20%,200V	EA	1	C107
	2401-001700	C-AL:477UF,20%,10V	EA	3	C153,154,155



Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
	2801-000002	CRYSTAL-UNIT:6.94407MHz	EA	1	XI
	3405-000125	SWITCH-MICRO:125V,5A,50gf	EA	2	SW151,152
	3601-000151	FUSE-FERRULE:125V,5A,NON	EA	1	F151
	3601-000157	FUSE-FERRULE:125V,8A,SLOW BLOW	EA	1	F101
	3704-000235	SOCKET-IC:28P,DIP,SN,2.54	EA	1	U2
	3711-000217	CONNECTOR-HEADER:1WALL,3P	EA	1	CN101
	3711-000901	CONNECTOR-HEADER:BOX,3P,1R	EA	1	CN8
	3711-002104	CONNECTOR-HEADER:1WALL,2P	EA	1	CN102
	3711-002653	CONNECTOR-HEADER:BOX,3P	EA	1	CN7
	3711-003203	CONNECTOR-HEADER:3WALL,6P	EA	1	CN1
	3711-003204	CONNECTOR-HEADER:BOX,24P	EA	1	CN5
	3711-003205	CONNECTOR-HEADER:BOX,4P	EA	1	CN2
	3711-003206	CONNECTOR-HEADER:BOX,8P	EA	1	CN6
	3711-003207	CONNECTOR-HEADER:BOX,13P	EA	1	CN3
	3712-000001	CONNECTOR-TERMINAL:PLATE	EA	1	THV
	6002-000154	SCREW-TAPPING:PH,+,2,M3,L	EA	1	Q203
	881 907029SA	IC-LIN,7029,MOTOR DRIVER:	EA	1	U1
	881 907552AA	IC-LIN,7552,PWM CONTROL:	EA	1	U101
	891 490526AB	TR-NPN,KSD526Y,T0-220:30W	EA	2	Q202,204
	935 240902DW	CON- WALL HEADER,2P,2.5MM	EA	1	CN4
	937 330009AA	MAG-SOLENOID,24V	EA	1	CLUTCH
SUB	JC96-00320A	ELA-H/SINK:ML-80	EA	1	110V ALL
	JC61-70100A	SPRING-PS:ML-66G,STS304-W	EA	1	FOR SMS H/SINK
	JC62-20001A	TUBE-IRF840:SSP5N90,N,90Q	EA	1	Q102
	0402-000304	DIODE-RECTIFIER:STPR1020CF	EA	1	D153
	0402-000314	DIODE-RECTIFIER:D10SC4M,40V	EA	1	D152
	0505-000135	FET-SILICON:IRF840,N,500V	EA	1	Q102
	1401-000108	THYRISTOR-TRIAC:100A,600V	EA	1	Q101
	6002-000154	SCREW-TAPPING:PH,+,2,M3,L	EA	1	Q203
	6003-000008	SCREW-TAPPING:BH,+,S,M3,L	EA	1	Q201
	6003-000119	SCREW-TAPPING:BH,+,B,M3,L	EA	1	D152

Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
	6003-000269	SCREW-TAPPING: BH, +, S, M3, L	EA	2	Q101, D153
	831 511011BA	COM, HEAT-SINK TRANS: AL 60	EA	1	Q102, D152, 153
	831 515034AA	COM, HEAT-SINK HVPS: SPCC t	EA	2	Q101, 201
	831 516035AA	COM, HEAT-SINK SMPS: AL t2.	EA	1	Q203
	891 490526AB	TR-NPN, KSD526Y, T0-220: 30W	EA	2	Q201, 203
SUB	JC96-01035A	<b>ELA- PCU SHIELD: ML-80, NO SCF+SWITCH</b>	EA	1	
	JC96-01034A	<b>ELA- PCU SHIELD: ML-80, SCF, NO SWITCH</b>			
	JC39-40020A	CBF-HARNESS: UL1061, 320MM, 8P	EA	1	CN6 (for QL-85's SCF)
	JC39-40022A	CBF-HARNESS: UL/CSA, 85MM, PULL, #22	EA	1	INLET
	JC39-40513A	CBF-HARNESS: ML-80, 220MM	EA	1	CN7
	JC39-40518A	CBF-HARNESS: ML-80, 220MM	EA	1	CN8
	JC70-10226A	IPR-SHIELD PCU: ML-80, SECC	EA	1	
	JC72-10201A	PPR-INSULATOR PCU: ML-80	EA	1	
	JF68-30527H	LABEL (R)-BAR CODE: SF1000	EA	1	
	JF68-30527J	LABEL (R)-BAR CODE: SF1000	EA	0.06	
	0201-000001	ADHESIVE-HR: #410, BLACK	GR	0.0001	
	0201-000007	ADHESIVE-CYA: N02/TOKYO/3B	KG	0.1	
	0201-000008	ADHESIVE-HM: PP_#3748, WHT	KG	0.005	
	1102-000239	IC-EPROM: 27C256, 32Kx8BIT	EA	1	U2
	6003-000132	SCREW-TAPTITE: BH, +, S, M4, L	EA	5	PCB & SHIELD
	6031-000120	WASHER-E, T: M4, ID4.3, OD8.5	EA	1	F.G (OF INLET HANESS)

## 8-8 Operator Panel Board

Lev	Code No.	Description/Specification	Unit	Q'ty	Locat i on No.
TOP	JC92-00346A	PBA-PANEL , 4LED, 1KEY:ML-85/85G	EA	1	ML-85, ML-85 plus, ML-85G plus, QwikLaser 85
<b>SUB</b>	JC92-00372A	PBA-PANEL , AUTO:ML-85/85G	<b>EA</b>		<b>AUTOMATIC</b>
	JC41-10003A	<b>PCB- PANEL</b> LED:ML-85/85G, FR-4	<b>EA</b>		<b>PCB- LED</b>
	2001-000032	R-CARBON: 180ohm, 5%, 1/4W	<b>EA</b>	<b>4</b>	R1, 2, 3, 4
	2202-000579	C-CERAMIC, MLC_AXIAL: 100nF, +80-20%, 50V	<b>EA</b>	<b>1</b>	<b>C1</b>
<b>SUB</b>	JC92-00373A	<b>PBA- PANEL, LED: ML- 85</b>	<b>EA</b>		<b>MANUAL</b>
	0601-000164	LED: ROUND, GRN, 5mm, 563nm	<b>EA1</b>		<b>LED1</b>
	0601-000255	LED: ROUND, RED, 5mm, 650nm	<b>EA1</b>		<b>LED4</b>
	0601-000304	LED: ROUND, YEL, 5mm, 585nm	<b>EA</b>	<b>2</b>	LED2, 3
	<b>3404-000116</b>	SWITCH-TACT: 12V, 50mA, 160g	<b>EA</b>	<b>1</b>	<b>SW1</b>
	<b>3711-001096</b>	CONNECTOR-HEADER: BOX, 7P	<b>EA</b>	<b>1</b>	<b>J1</b>

Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
TOP	JC94-00985A	PBA-PANEL , 5LED, NOKEY:ML-80	EA	1	ML-85G, QwikLaser 85G
	JC41-10521A	PCB-PANEL 5LED:ML-80, FR-4	EA	1	PCB-5LED, NO KEY
	2001-000032	R-CARBON: 180ohm, 5%, 1/4W	EA	5	R1, 2, 3, 4, 5
	2202-000579	C-CERAMIC, MLC_AXIAL: 100nF, +80-20%, 50V	EA	1	C1
	0601-000164	LED: ROUND, GRN, 5mm, 563nm	EA	2	LED1, 5
	<b>0601-000255</b>	LED: ROUND, RED, 5mm, 650nm	<b>EA</b>	<b>1</b>	<b>LED4</b>
	<b>0601-000304</b>	LED: ROUND, YEL, 5mm, 585nm	<b>EA</b>	<b>2</b>	LED2, 3
	<b>3711-001096</b>	CONNECTOR-HEADER: BOX, 7P	<b>EA</b>	<b>1</b>	<b>J1</b>

8-9 Erasing Lamp Board

Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
TOP	JC96-00286A	ELA-ERASE LAMP:ML-80,SEC	EA	1	UPG
	JC39-40512A	CBF-HARNESS:ML-80,FLAT	EA	1	
	JC41-10007A	PCB-QUENCH:ML-80,QUENCH	EA	1	=ERASE
	JC68-10526A	LABEL(P)-VOLTAGE:ART	EA	1	
	JC70-10002A	IPR-BRKT ERASE:ML-80,SEC	EA	1	
	JC70-10913A	IPR-CONNECTOR CL/R:ML-80	EA	1	CLEANING
	JC72-10908A	PPR-CONNECTOR CL/R:ML-80	EA	1	CLEANING
	0601-000009	LED:ROUND,RED,5.6X4.8MM	EA	23	D1~23
	2001-000061	R-CARBON:33ohm,5%,1/4W	EA	3	RI-3
	3711-000023	CONNECTOR-HEADER:BOX_LATCH	EA	1	
	6003-000119	SCREW-TAPTITE:BH,+,B,M3,L	EA	1	
	6003-000179	SCREW-TAPTITE:PH,+,S,M3,L	EA	4	

8-10 OPC Board & Cleaning Board

Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
TOP	JC96-01023A	EIA UNIT-ZENER BOARD : ML-80,	EA	1	OPC Board

Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
TOP	JC92-00917A	PBA-CLN ML: ML-80, ALL	EA	1	Cleaning Board
	JC44-10501A	SMPS-CLNBOARD:ML-80,DC/DC	EA	1	CLEANING PBA

# 8-11 Video Controller Board

8-11-1 ML-85, ML-85 plus or QwikLaser 85

Lev	Code No.	Description/Specification	Unit	Q'ty	Local t ion No.
TOP	JC92-00312A	PBA-CONTROLLER: ML-85	EA	1	ALL
SUB	JC92-00356K	PBA-CONTROLLER, SMD: ML-85	EA	1	
	JC09-10302B	IC-MICOM MASKING: SC68322	EA	1	U9
	JC11-10001A	IC-MASK ROM: ML-85, KM23C1600AG-12	EA	1	U8
	JC41-10010A	PCB-MAIN: ML-85, 4L, FR-4	EA	1	PCB
	0202-000001	SOLDER-PASTE: RMA2007, 11%	KG	0.001	
	0407-001008	DIODE-ARRAY: DA204K, 20V	EA	17	D2-18
	0803-000117	IC-TTL: 74F14, INVERTER, SOP	EA	1	U12
	0803-000274	IC-TTL: 74F32, OR GATE, SOP	EA	1	U11
	0803-000468	IC-TTL: 74LS273, D FLIP-FLOP	EA	1	U2
	1006-000243	IC-LINE TRANSCEIVER, 74ACT	EA	1	U3
	1103-000133	IC-EEPROM: 93C66, 256K*16BIT	EA	1	U1
	1105-000191	IC-DRAM: 416C1200, 256K*16BIT	EA	1	U10
	1203-000346	IC-VOL. SUPERVISORY: 7705	EA	1	U13
	2007-000290	R-CHIP: 100ohm, 5%, 1/10W	EA	7	R37, 49, 56, 57, 59, 60, 73
	2007-000300	R-CHIP: 10Kohm, 5%, 1/10W	EA	20	R1, 3, 5, 6, 8, 9, 30, 32, 36, 40, 58, 68, 78, 80, 82, 83, 84, 86, 87, 90
	2007-000308	R-CHIP: 10ohm, 5%, 1/10W	EA	2	R38, 81
	2007-000449	R-CHIP: 180ohm, 5%, 1/10W	EA	5	R43, 44, 55, 34, 35
	2007-000468	R-CHIP: 1Kohm, 5%, 1/10W	EA	17	R12, 14, 16, 17, 20, 23, 24, 27, 28, 48, 51, 52, 53, 54, 85, 89, 146
	2007-000658	R-CHIP: 27ohm, 5%, 1/10W	EA	4	R10, 11, 61, 71
	2007-000781	R-CHIP: 33ohm, 5%, 1/10W	EA	15	R2, 4, 13, 15, 18, 19, 21, 22, 25, 26, 31, 33, 39, 50, 69
	2007-000931	R-CHIP: 470ohm, 5%, 1/10W	EA	1	R88
	2007-000964	R-CHIP: 5.1Kohm, 5%, 1/10W	EA	5	R41, 42, 45~47
	2007-001133	R-CHIP: 68ohm, 5%, 1/10W	EA	66	R29, 62~67, 72, 74~77, 91~106, 108~145

Lev	Code No.	Description/Specification	Unit	Qty	Location No.
	2203-000199	C-CERAMIC,CHIP:100nF	EA	35	C1,2,6,7,10~12,14,17~24 27~30,32~43,49,50,56
	2203-000239	C-CERAMIC,CHIP:100pF,5%	EA	30	C26,31,46,58~64,66~79,83 91-95
	2203-000455	C-CERAMIC,CHIP:1nF,5%	EA	6	C13,51~55
	2203-000595	C-CERAMIC,CHIP:220pF,5%	EA	3	C80~82
	2203-000953	C-CERAMIC,CHIP:470PF,5%	EA	10	C4,5,8,15,16,25,44,45,47,48
	2404-000308	C-TA,CHIP:33uF,20%,10V	EA	3	C9,57,90
	2901-000235	FILTER-EMI SMD:50V,300mA	EA	1	LF5
	3704-000280	SOCKET-IC:44P,PLCC,SN	EA	2	U5,6
	911 700007BSI	REF-CHIP,0.5%,1/10W:150V	EA	1	R79
SUB	JC92-00357F	PBA- CONTROLLER: ML- 85	EA	1	
	JC68-10529AI	LABEL(P)-ROM:ML-80,ARTI	EA	2	U5,6
	1102-000130	IC-EPROM:27C4096,256K*16BIT	EA	2	U5.6
	2804-000260	OSCILLATOR-CLOCK:40MHz	EA	1	OSC1
	2804-000351	OSCILLATOR-CLOCK:30.075MHz	EA	1	osc2
	3702-000118	CONNECTOR-RIBBON:36P,FEMALE	EA	1	J2
	3703-000126	CONNECTOR-DIN:20P,2R,MALE	EA	1	J5
	3709-000177	CONNECTOR-CARD EDGE:72P	EA	1	J1
	3711-001091	CONNECTOR-HEADER:BOX,7P	EA	1	J4
	3711-003204	CONNECTOR-HEADER:BOX,24P	EA	1	J3
	3711-003205	CONNECTOR-HEADER:BOX,4P	EA	1	J6

Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
SUB	JC96-00317B	ELA-SHIELD:ML	EA	1	
	JC70-10206A	IPR-BRACKET ICU:ML-80	EA	1	
	6003-000127	SCREW-TAPTITE:BH,+,S,M3	EA	2	
AUX	JF68-30527H	LABEL(R)-BARCODE	EA	1	
AUX	JF68-30527J	LABEL(R)-BARCODE	EA	0.0001	

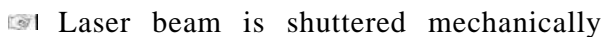


8-11-2 ML-85G, ML-85G plus or QwikLaser 85G

Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
TOP	JC92-00344B	PBA-CONTROLLER:ML-85G	EA	1	<b>ML- 85G</b> <b>QwikLaser 85G</b> (EEPROM & R61) <b>ML-85G plus (READY LED ON)</b>
	JC92-00344C	<b>PBA- CONTROLLER: QL- 85G</b>		1	
	JC92-00312H	PBA-CONTROLLER:ML-85G <b>plus</b>			
SUB	JC92-00356D	<b>PBA- CONTROLLER, SMD: ML- 85G</b>	EA	1	<b>ML- 85G</b> <b>QwikLaser 85G</b> <b>ML-85G plus</b>
	JC92-00356H	PBA-CONTROLLER, SMD: QL-85G		1	
	JC92-00370Q	<b>PBA- CONTROLLER, SMD: ML- 85G plus</b>			
	JC13-10001A	<b>IC- ASIC, CONTROL: ML- 85G</b>	EA	1	U3
	JC41-10011B	PCB-CONTROLLER:ML-85G, QL-85G	EA	1	ML-85G, QwikLaser-85G
	JC41-10303N	<b>PCB- CONTROLLER: ML- 85G plus</b>			<b>ML- 85G plus</b>
	<b>0202- 000001</b>	SOLDER-PASTE:RMA2007, 11%	KG	<b>0.001</b>	
*	0407-001008	DIODE-ARRAY:DA204K, 20V	EA	17	D2~18
*	<b>0407- 001008</b>	DIODE-ARRAY:DA204K, 20V	EA	2	D19, 20 <b>(FOR ML-85G plus)</b>
	<b>0801- 000012</b>	<b>IC- CMDS LOGIC:74HC14</b>	EA	2	U7, 8 <b>(FOR ML-85G plus)</b>
	<b>0803- 001040</b>	IC-TTL:74LS14, SCHMITT INVERTER, SOP	EA	1	<b>u4</b>
	<b>1105- 000180</b>	IC-DRAM:48C512, 512*8BIT	EA	1	U5
	<b>1203- 000346</b>	<b>IC- VOL. SUPERVISORY: 7705</b>	EA	1	U1
	<b>2007- 000290</b>	R-CHIP:100ohm, 5%, 1/10W	EA	14	R31, 32, 36~38, 42~45, 47~49, 72, <b>83</b>
	<b>2007- 000290</b>	R-CHIP:100ohm, 5%, 1/10W	EA	2	R86, 87 <b>(FOR ML- 85G plus)</b>
	<b>2007- 000300</b>	R-CHIP:10Kohm, 5%, 1/10W	EA	14	R2, 6, 7, 10, 11, 13, 16, 17, 73~78
	<b>2007- 000300</b>	R-CHIP:10Kohm, 5%, 1/10W	EA		<b>R82 (FOR ML- 85G plus)</b>
	<b>2007- 000449</b>	R-CHIP:180ohm, 5%, 1/10W	EA	5	R24~26, 30, 84
	<b>2007- 000468</b>	R-CHIP:1Kohm, 5%, 1/10W	EA	5	R4, 18, 19, 50, 85
	<b>2007- 000477</b>	R-CHIP:1Mohm, 5%, 1/10W	EA	1	R81 <b>(ML- 85G plus)</b>
	<b>2007- 000511</b>	R-CHIP:2.4Kohm, 5%, 1/10W	EA	12	R20, 22, 23, 34, 35, 39~41, 51~54
	<b>2007- 000511</b>	R-CHIP:2.4Kohm, 5%, 1/10W	EA	2	R79, 80 <b>(FOR ML- 85G plus)</b>
	<b>2007- 000572</b>	R-CHIP:220ohm, 5%, 1/10W	EA	2	R8, 14
	<b>2007- 000781</b>	R-CHIP:33ohm, 5%, 1/10W	EA	15	R3, 9, 12, 46, 55, 62~71
	<b>2007- 000931</b>	R-CHIP:470ohm, 5%, 1/10W	EA	1	<b>R1</b>
	<b>2007- 000964</b>	R-CHIP:5.1Kohm, 5%, 1/10W	EA	5	R21, 27~29, 33

Lev	Code No.	Description/Specification	Unit	Q'ty	Location No.
	2203-000199	C-CERAMIC,CHIP:100nF	EA	25	C1,3,12,BC1~20,BC22,23
	2203-000199	C-CERAMIC,CHIP:100nF	EA	2	BC24,25 (FOR ML-85G plus)
	2203-000239	C-CERAMIC,CHIP:100pF,5%	EA	17	C26~33,35~38,43~47
	2203-000260	C-CERAMIC,CHIP:10nF,10%	EA	6	C4,7,8,13~15
	2203-000455	C-CERAMIC,CHIP:1nF,5%	EA	9	C18,20,21,34,39~42,BC21
	2203-000609	C-CERAMIC,CHIP:22nF,5%	EA	1	C11
	2203-000953	C-CERAMIC,CHIP:470PF,5%	EA	7	C5,6,19,22~25
	2404-000151	C-TA,CHIP:1uF,20%,16V	EA	1	C10 (FOR ML-85G plus)
	2404-000308	C-TA,CHIP:33uF,20%,10V	EA	3	C9,TC1,TC5
	2901-000229	FILTER-EMI SMD:50V,300mA	EA	2	L2,3
	2901-000235	FILTER-EMI SMD:50V,300mA	EA	2	L1,4
	911 700007BS	REF-CHIP,0.5%,1/10W:150V	EA	4	R57~60
	911 700007BS	REF-CHIP,0.5%,1/10W:150V	EA	1	R61 (FOR QwikLaser 85G)
SUB	JC92-00370R	PBA-CONTROLLER:ML-85G,NO EEPROM	EA	1	ML-85G, ML-85G plus
	JC92-00357D	PBA-CONTROLLER:QL-85G,EEPROM		1	QwikLaser 85G
	1102-000235	IC-EPROM:27C256,32K*8BIT	EA	1	U2B (QwikLaser 85G)
	2804-000351	OSCILLATOR-CLOCK:30.075MHz	EA	osc2	
	3301-000344	CORE-FERRITE BEAD:ZZ	EA	5	BD1-5
	3702-000118	CONNECTOR-RIBBON:36P,FEMALE	EA	1	J2
	3704-000349	SOCKET-IC:8P,DIP,SN,2.54MM	EA	1	U2B (QwikLaser 85G)
	3711-001091	CONNECTOR-HEADER:BOX,7P	EA	1	J4
	3711-003204	CONNECTOR-HEADER:BOX,24P	EA	1	J3
	3711-003205	CONNECTOR-HEADER:BOX,4P	EA	1	J6
SUB	JC96-00317B	ELA-SHIELD:ML	EA	1	
	JC70-10206A	IPR-BRACKET ICU:ML-80	EA	1	
	6003-000127	SCREW-TAPTITE:BH,+,S,M3	EA	2	
AUX	JF68-30527H	LABEL(R) - BARCODE	EA	1	
AUX	JF68-30527J	LABEL(R) - BARCODE	EA	0.0001	

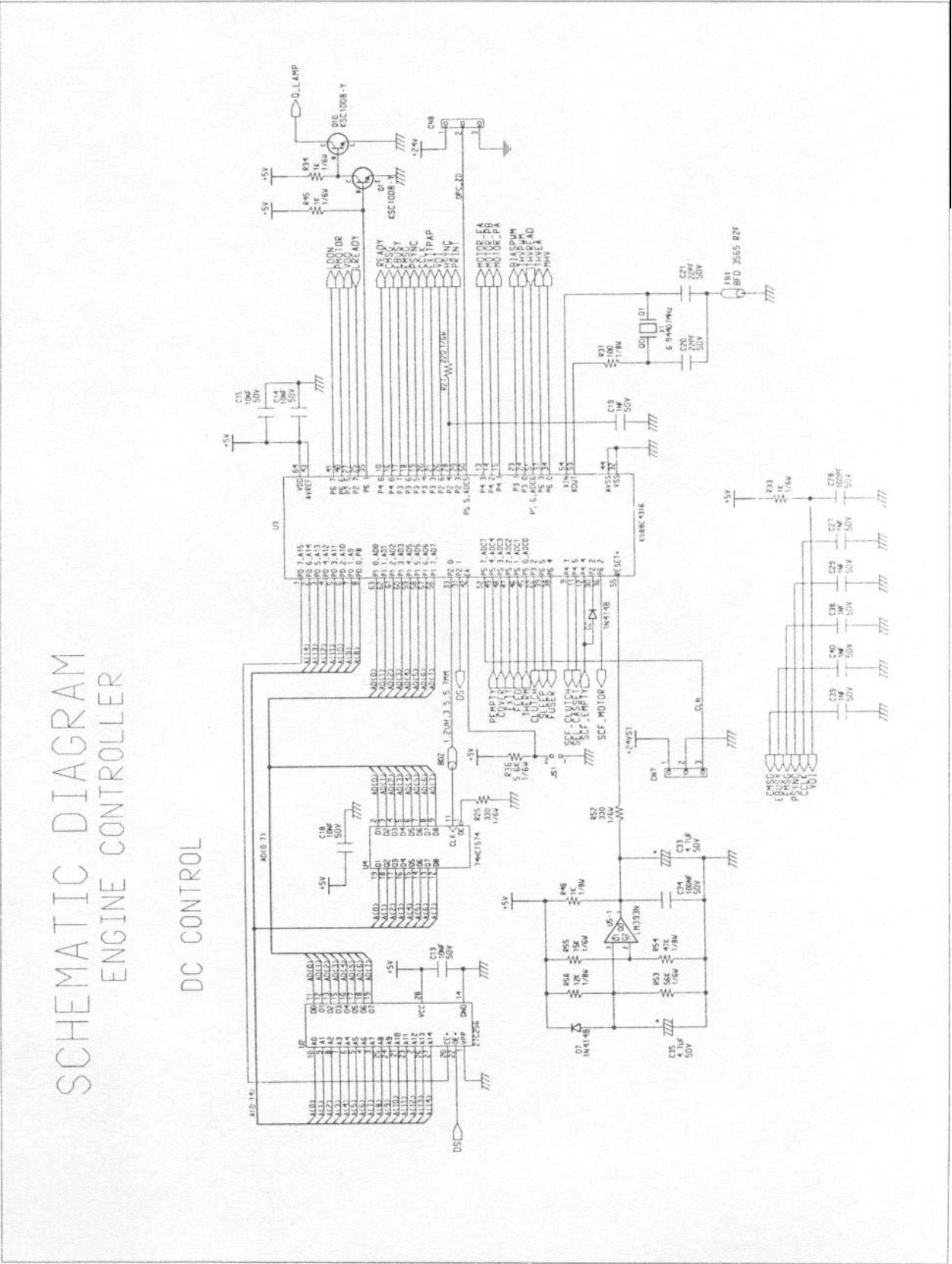
## 10-1 Engine Board



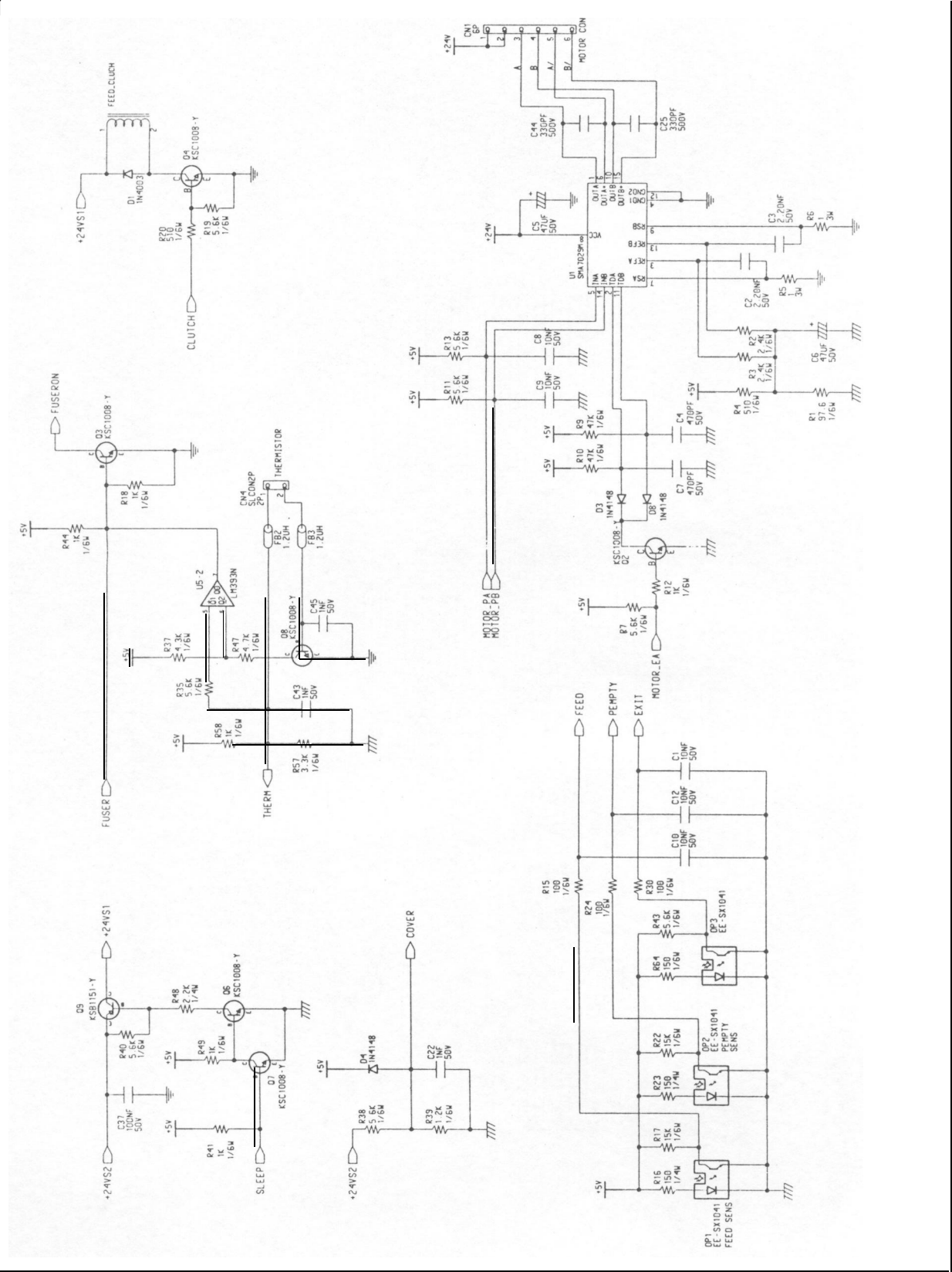
# 13. Schematic Diagrams

## 13-1 Engine Board

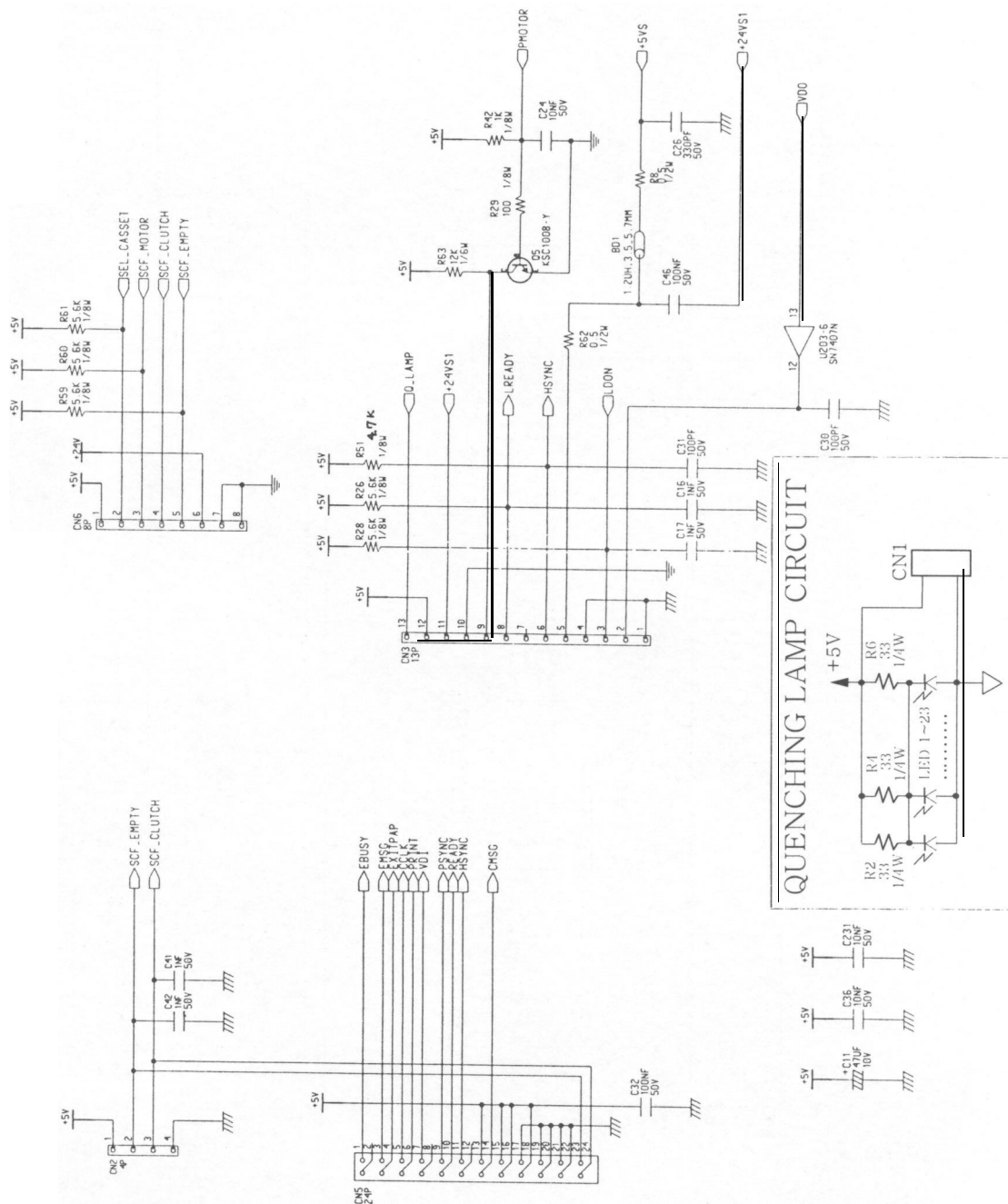
### 13-1-1 CPU & Reset Circuit



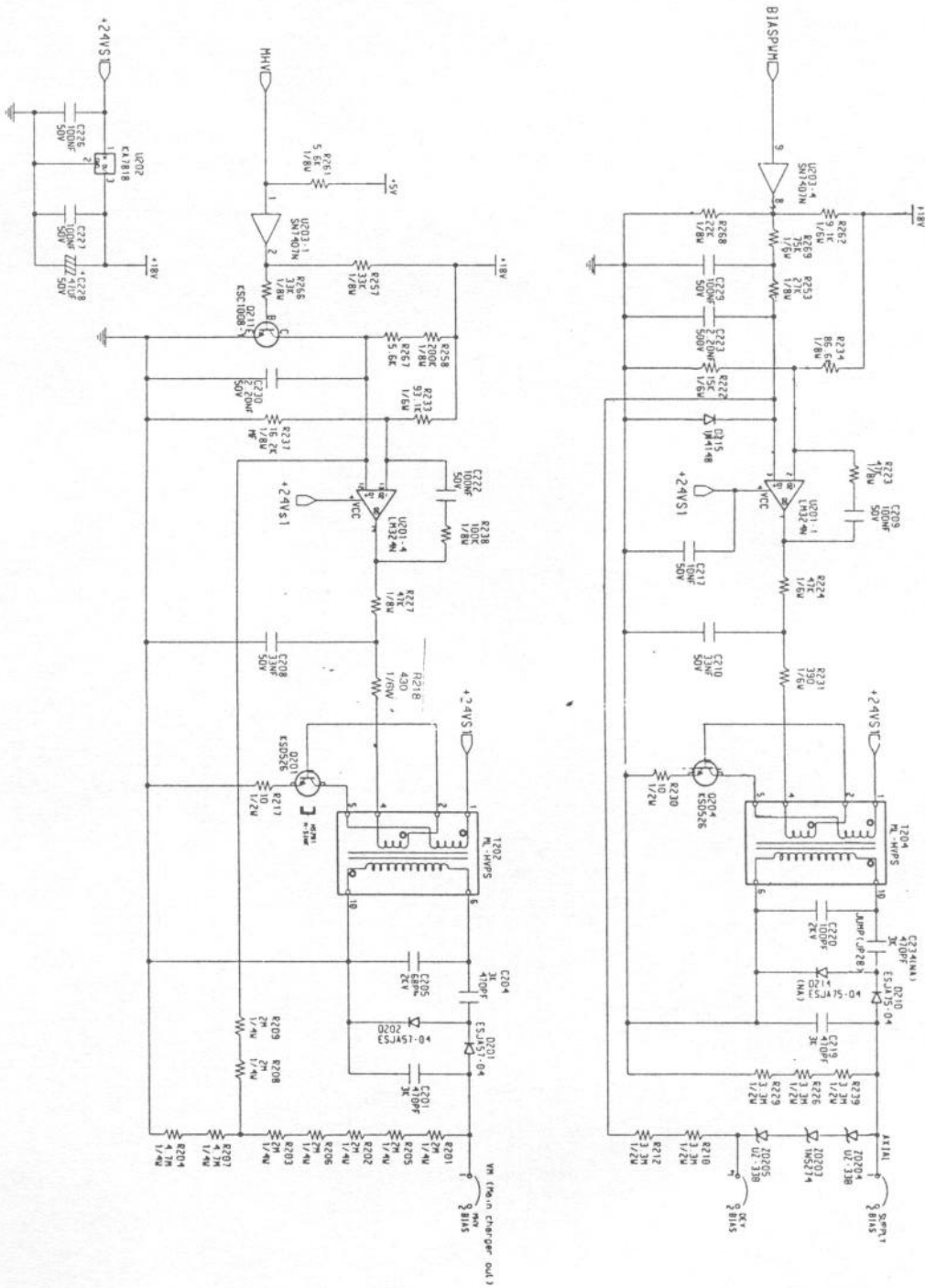
13-1-2 Motor Drive Circuit & Sensors



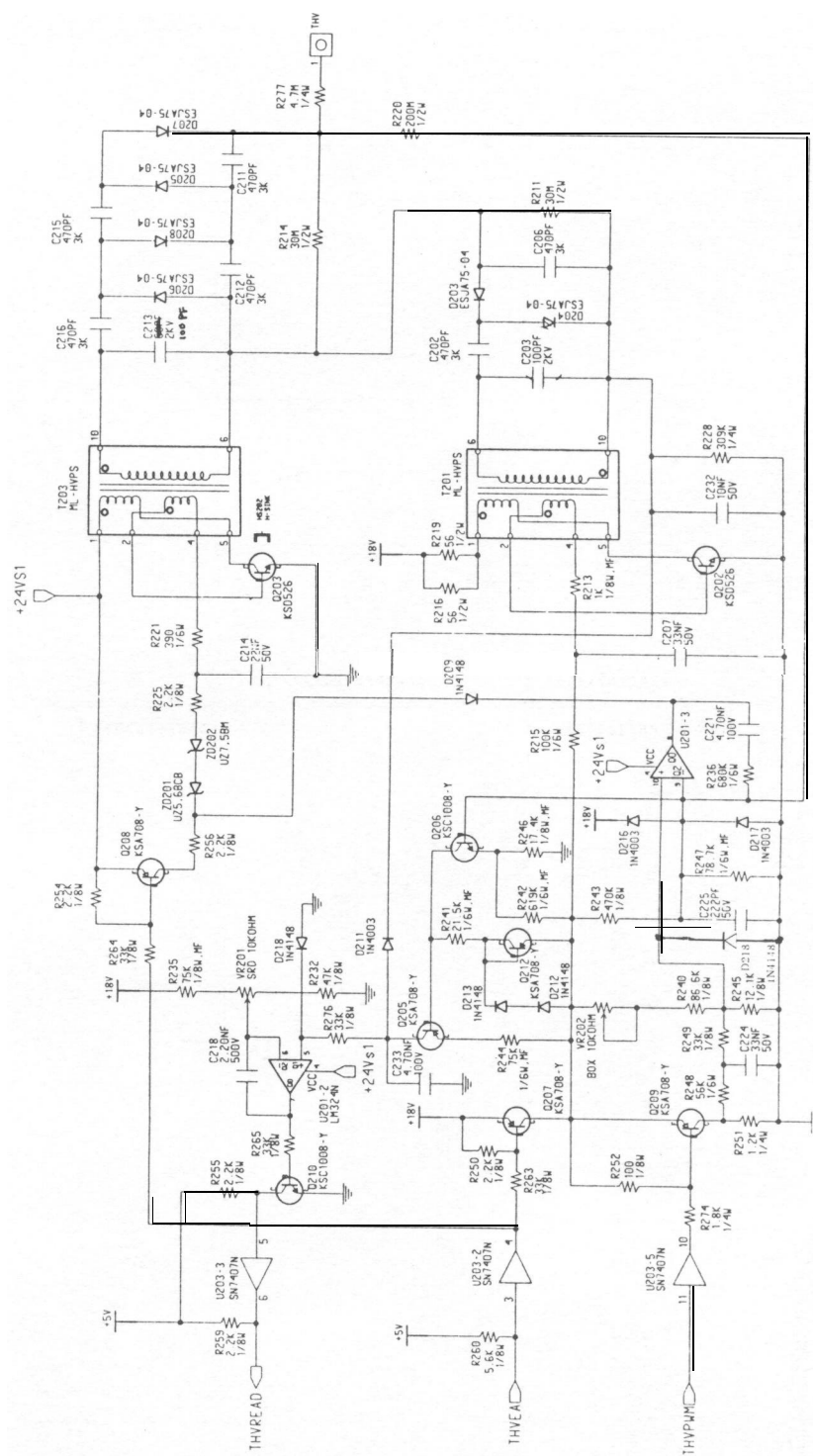
13-1-3 Interfaces and Quenching Lamp Circuit



13-1-4 HVPS Bias Circuit



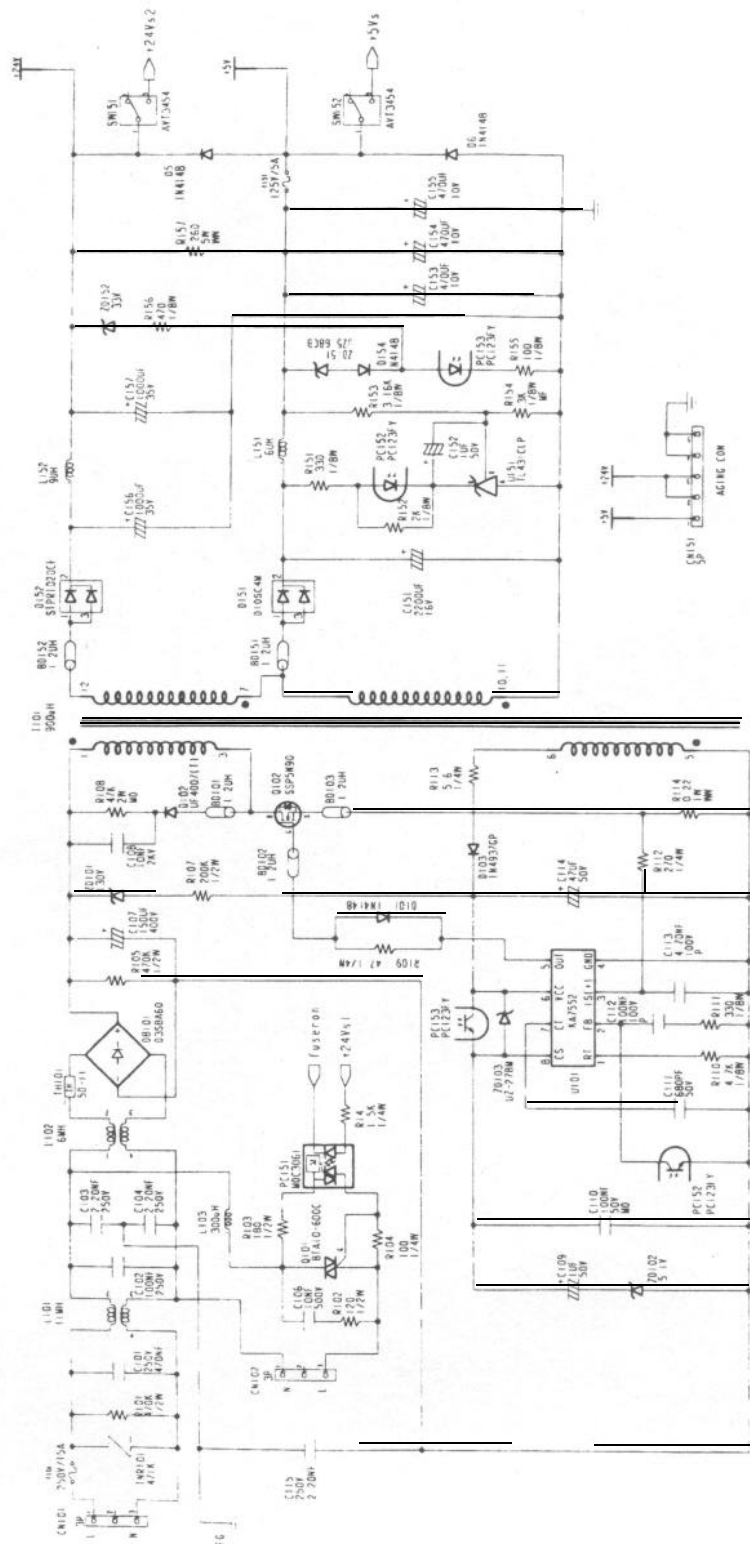
13-1-5 HVPS Transfer Circuit





13-1 -6 SMPS Circuit(220~240V)

SMPS(for 220-240VAC)



### 13-1-7 SMPS Circuit(11 O-1 20V)

